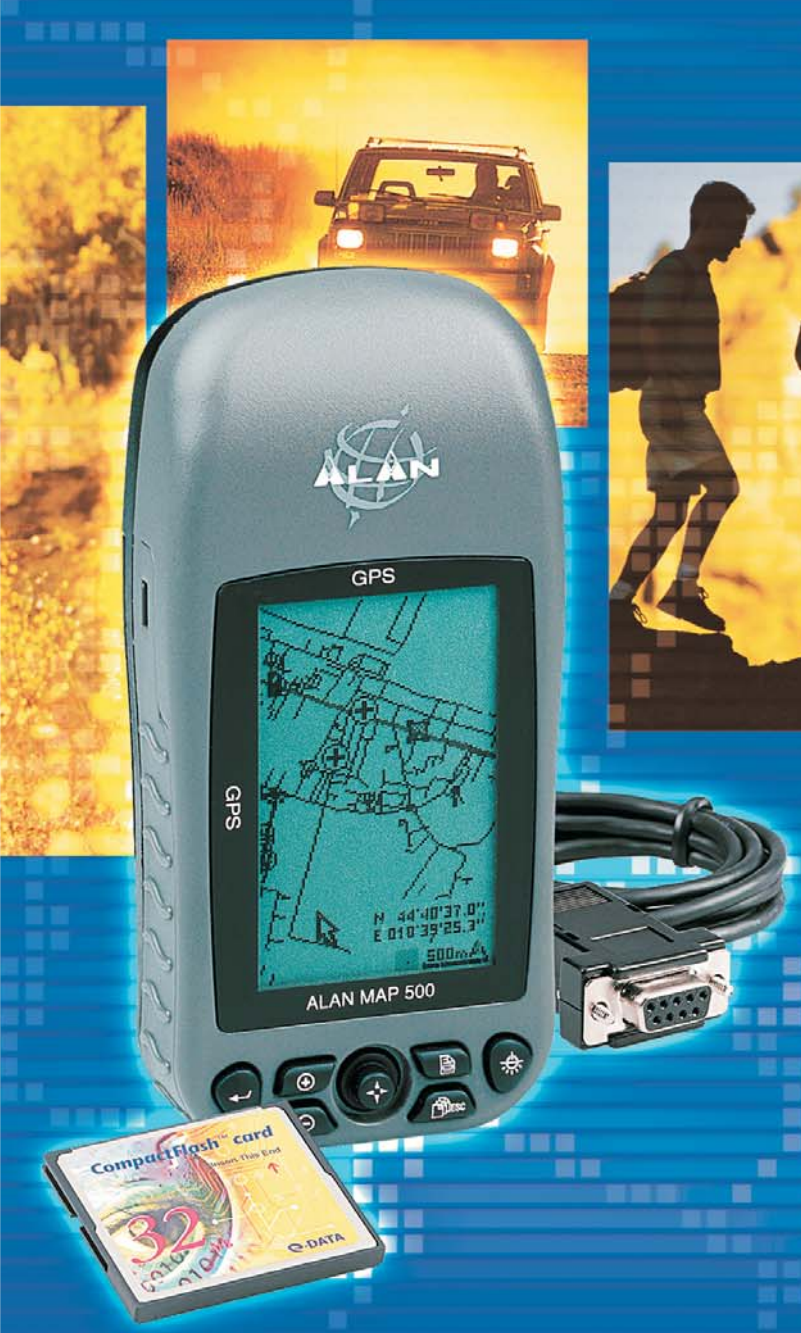
Advanced cartographic navigator

ALAN®



ALAN MAP 500

by MIDLAND®

User's Manual

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All our hardware/software/firmware updates, as well as the newest operating instruction version may be downloaded under www.cte.it

1. Important Warnings

1.1 Symbols used

For ease and convenience in reading this manual, symbols are used to highlight urgent situations, practical advice, and general information.

Exclamation marks such as this one indicate a crucial description regarding technical repairs, dangerous conditions, safety warnings, advice and/or important information. Failing to observe these symbols may result in serious problems and/or damage and/or personal injury.

Note pages such as this one indicate key practical advice that we recommend following to ensure MAP 500's optimal performance.

1.2 Warnings

This manual is laid out for devices with operating system (= firmware) version V2.02ZA and/or V2.02ZA-CF (with storage on CF-Card); V2.02ZA version stores all the data such as waypoints, routes, tracks etc. on the internal memory of the GPS receiver.

WARNING! Pay close attention to all of the warnings below. Failing to observe these warnings may result in serious problems and/or damage and/or personal injury. Deviations in the operation can occur with other firmware designs. Changes, which serve technical progress, we reserve ourselves. CD ROM belonging to the MAP 500 has the version number 1.2 and can be used together with Detail maps CD starting from version 1.1.

- **This GPS is intended solely as an aid to navigation.** This receiver should not be considered a substitute either for standard navigation procedures or for reasonable prudence and judgment.
- **When using this receiver in a vehicle, do so only when you are not the driver, when the vehicle is stopped, or in an emergency.** Using this receiver while driving is dangerous and may cause accidents or collisions. While driving, pay attention to your driving!
- **When the sockets are not in use, protect them with the rubber cover.**
- **Observe all precautions regarding use of the batteries**, as described further in Ch.4.2.
- **Do not use alcohol, solvents, or abrasives to clean MAP 500**. Use a soft, clean cloth that is slightly damp with water. In more difficult cases, use a mild detergent.
- **Do not expose MAP 500 to ambiental conditions which are excessively humid or dusty, or to temperatures outside the -10°C to +70°C range.** Also avoid exposure to direct sunlight. For example, do not leave the receiver on the dashboard of a vehicle which is exposed to summer sunlight, or to alpine temperatures during the winter.
- **Avoid jarring, mechanical shock, and excessive vibration.** The receiver was designed to resist jarring and vibrations that are within the norm of any electronic device.
- **Do not open the receiver for any reason.** MAP 500's precision mechanics and electronics require experienced technicians and specialized equipment. Unauthorized opening of MAP 500 will nullify the warranty and will damage the waterproof poured chassy parts.
- **Do not replace or recharge the receiver's batteries in potentially explosive environments.** A single spark may cause an explosion.

2. Introduction

2.1 Your MAP 500

Congratulations on your purchase! MAP 500 is a portable GPS receiver with integrated cartography. It is extremely precise and was designed for general purpose of positioning and navigation. The receiver is able to establish not only your current position, but also to guide you towards a memorized destination using the geographical reference coordinates along the route (called waypoints) to create one or more route as desired.

Listed below are the principal features and abilities of your MAP 500 GPS:

- Reception and acquisition of up to 12 satellites
- Menu selectable in 6 different languages
- GPS altitude indication is already converted to altitude over sea-level
- The most used national coordinate systems in Central Europe and map data (e.g. Gauss Krueger, Swiss and Austrian lattice systems) are integrated.
- Memorization of 1000 geographical references (waypoints) with associated named and graphic symbols programmed by the user
- Integrated cartography with 9 levels of zoom as well as display/hide of reference symbols as desired
- Optional storage of Track -, waypoint and route files on CF-card possible (it requires the download of special operating system V2.02ZA-CF which is not included in the supply).
- Possibility of memory expansion using ordinary Compact Flash cards (not supplied)
- Ability to navigate using 50 routes and 150 waypoints for each route
- Ability to select various graphic representations of your position and direction of movement
- Automatic memorization of up to 8 + 1 tracks of your route movement
- Large back-lit LCD display with adjustable contrast
- Compact Flash (CF) memory card, which memorizes maps
- Connectable to a PC for downloading of maps and updating of operating system
- Uses two normal AA batteries, including rechargeable ones (set not supplied)
- Multi-functional Joystick for practical use
- External antenna socket for use inside vehicles

For further information regarding the function of the GPS network, refer to Chapter 14.

3. Description of MAP 500

3.1 Buttons and controls

3.1.a Front Panel

[1] **Integrated GPS antenna** – for signal reception from GPS satellites. For optimal reception, the antenna should be pointed towards the sky at an angle of approx. 45 degrees.

[2] **LCD display (liquid crystal)** – displays different pages (screens), command menus and modes of operation.

[3] **button (menu)** – accesses the command menu available for each page (screen) of the receiver and for programming of various functions.

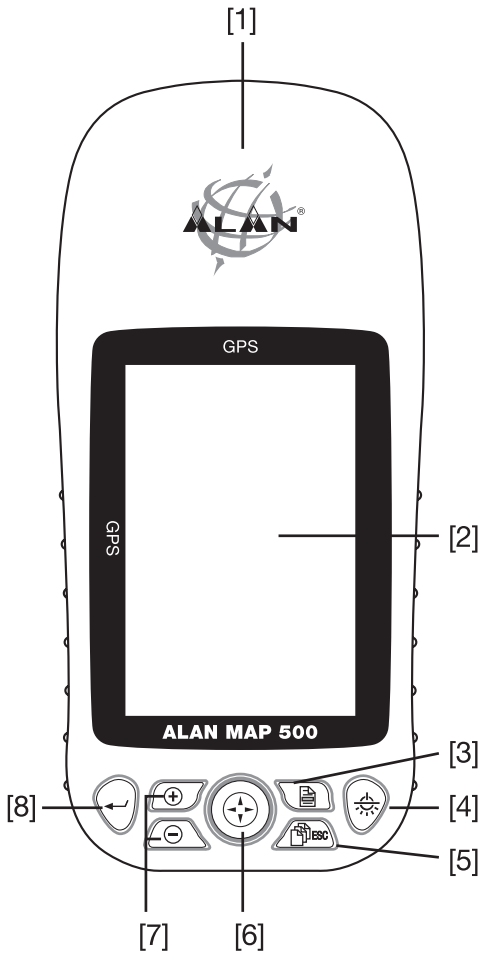
[4] **button (on/off-backlighting).** Serves two functions:
- holding down the button for at least 2 seconds, the receiver turns on/off
- when the receiver is turned on, briefly pressing the button activates and deactivates the display backlighting

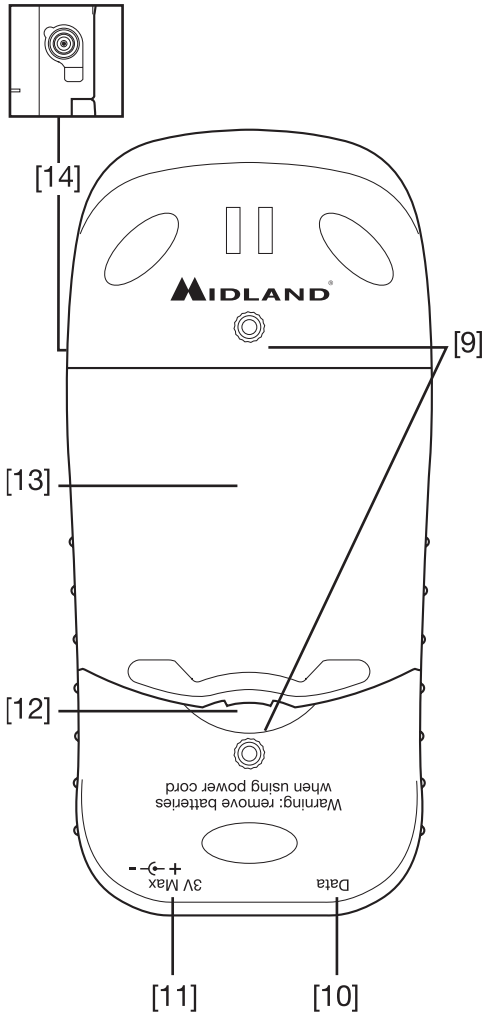
[5] **button (pages/exit)** – for selection of main pages (screens) and going backwards through the command menus without creating or changing settings.

[6] **direction Joystick** – for using many functions, such as scrolling through maps on the screen, moving the cursor, etc.

[7] **and** **buttons (zoom)** – for enlarging and reducing the scale of maps

[8] **button (confirm)** – confirms commands selected in the menu





3.1.b Back Panel and Connections

[9] **Threaded junctures** – for mounting on the bracket

[10] **Data socket (on the bottom of the receiver, under the protective cap)** – for connecting to a PC via the DL 500 cable for downloading of maps and various data, using a standard NMEA.

[11] **3V max socket (on the bottom of the receiver, under the protective cap)** - 3VdC socket for recharging Ni-MH batteries using a suitable AC battery charger (or DC cable adaptor).

[12] **Lever on battery well cover** – for opening the battery compartment.

[13] **Battery compartment** – for insertion of 2 AA batteries, either alkaline or rechargeable Ni-MH.

[14] **External antenna socket** – for the connection of an active external antenna, for use when there is insufficient visibility of the sky (e.g., inside a vehicle).

- ***Do not connect the battery charger when using normal alkaline batteries (or other non-rechargeable batteries) as this may damage the equipment.***
- ***Remove the protective cap from the sockets only when using them; this will avoid exposure to humidity or other damaging agents.***
- ***Do not remove the batteries before switching off your MAP 500! All the internal settings, the new waypoints and routes are in fact permanently saved in your MAP 500 only in the switching off phase***

4. Preparation of the equipment

4.1 Unpacking

When opening the box containing your receiver, ensure that the package includes your MAP 500, as well as:

- GPS Receiver
- Quick guide
- CD-ROM with detailed user manual & MapShow installing programme and further additional Software
- Certificate of warranty

Depending on the model, some parts may already be attached/connected to the receiver. In any case, if any parts are missing, contact your supplier immediately.

4.2 Installation of batteries

4.2.a Types of useable batteries

The GPS functions with two AA batteries, which should be installed in the battery compartment. The receiver operates using:

- Alkaline batteries (non-rechargeable)
- Ni-MH rechargeable batteries (Nickel-metal hydrate). For further details on the use and recharging of these batteries, refer to par.4.3. A capacity lower than 1300 mAh is not recommended (these devices deliver max. 8 hours operation time and higher capacity batteries are increasing the operation time)!

Although alkaline batteries allow for superior autonomy with respect to rechargeable ones, we suggest using the rechargeable Ni-MH batteries if you are using your MAP 500 frequently as this will reduce operating costs. To extend the battery life, try rotating through multiple sets of batteries.

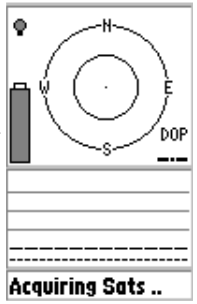
4.2.b Installation procedure

To install the batteries (refer to the diagram in par.3.1.b):

1. Move the lever to centre on the cover of the battery compartment and pull it out.
2. Remove the battery well cover.
3. Install 2 charged AA batteries, paying attention to the polarities, as shown on the bottom of the battery compartment.
4. Point the top part of the battery well cover (the part opposite to the lever) towards the correct position of the battery well.
5. Press the bottom part (the part with the lever) of the cover against the body of the receiver. You will hear it click when firmly in place.

Remove the batteries from the receiver when not in use for long periods of time. This precaution eliminates the likelihood of battery leakage and corrosion of the receiver. Also, certain circuits are constantly being supplied electricity, even when the receiver is turned off. This consumption is very low, but over time may drain the batteries.

(A) Remaining battery power icon



Do not combine old batteries with new ones and/or different types and/or for different uses. Each set of batteries used must be composed of the same 2 elements, and cannot be used separately or for use with other devices. Don`t mix batteries of different brand, too!

Never throw batteries into a fire or bring them close to a source of heat: this may cause explosions and personal injury. Dispose of your batteries according to local regulations.

4.3 Recharging of rechargeable batteries

The type of battery we recommend is a high-capacity (at least 1.300 mAh), rechargeable Ni-MH (Nickel-metal hydrate). Ni-MH batteries have a better capacity compared to normal Ni-Cad batteries, and are less likely to produce a "memory effect" reaction (for further details on memory effect, refer to par.4.3.b). There are two ways to recharge batteries:

- Separate recharging of batteries (outside the receiver) – use a suitable, external battery charger (not supplied) to charge the batteries before putting them into the receiver. Recharge time varies according to the type of charger and the capacity of the batteries utilized.
- Charge the batteries while they are in the receiver – use the optional car battery charger. This is connected to the appropriate socket in the receiver 3V Max.

Do not attempt to charge alkaline batteries or other non-rechargeable batteries. Ensure that only 2 rechargeable Ni-MH batteries are used in the battery well of the receiver, with the battery charger connected. Attempting to recharge other types of batteries (for ex. alkaline/Mangan type) is extremely dangerous. Non-suitable batteries may leak liquid, explode, or burn and cause serious damage!

Ensure that the original charger is used. Using an unsuitable battery charger or batteries may damage your receiver or cause explosions or personal injury. When in doubt, contact your supplier.

4.3.a Checking battery power

When the device is being used, the Satellites page continually displays the battery icon (A). The internal part of the icon displays the remaining battery power: a full icon indicates high battery power; an empty icon indicates low battery power. To switch to the Satellites page, refer to par.6.1.

Similar to gas indicators in a vehicle, the indicator is not proportional to the actual charge (e.g., a half-full battery icon does not indicate that exactly half of the battery power remains). Furthermore, this indication varies according to the type of batteries used (alkaline or rechargeable Ni-MH).

4.3.b Memory effect on rechargeable batteries

Rechargeable Ni-MH batteries (Nickel-metal hydrate) have almost no "memory effect". This memory effect results in a drastic reduction of autonomy of use of the device, and is triggered if the batteries are regularly recharged before completely running out of battery power and/or when the batteries are not completely recharged.

To avoid this memory effect:
- When possible, recharge batteries only once they have completely run out of power (until the receiver turns off during normal use).
- Do not disconnect the battery charger before the batteries are completely recharged.
- Completely discharge and recharge your batteries at least twice a month.

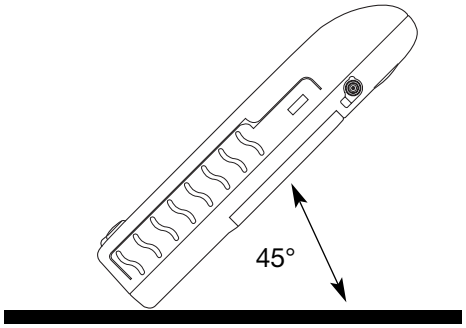
In any case, the most effective solution for avoiding memory effect is to rotate the use of two sets of batteries, keeping one charged set on hand while the other set is in use in the GPS.
To completely eliminate the memory effect on batteries, discharge and recharge the batteries completely at least three or four times before using them again.

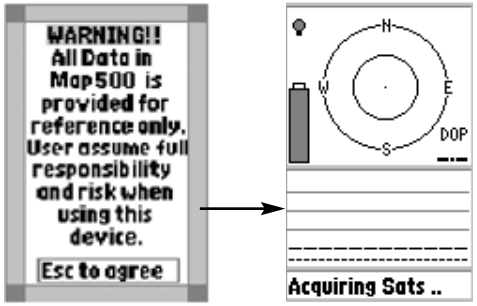
Memory effect should not be confused with the normal life of the batteries, which is on average 300-400 charge/discharge cycles. It is normal for the operating power of the batteries to diminish as the batteries begin to near the end of their life. When this happens, substitute the entire set of batteries.

4.3.c Installing a CF memory card

MAP 500 is equipped with a housing for CF cards (Compact Flash) with a capacity of up to 512 MB for the downloading of detailed maps. To install the card:

1. Ensure MAP 500 is turned off.
2. Turn MAP 500 so its back panel is facing you and the bottom part is facing downwards.
3. Move the lever to centre on the cover of the battery compartment and pull it outwards.
4. Remove the battery compartment cover.
5. Remove the batteries (if installed) and align the CF card so the two lateral reference notches are facing you and the connector is facing downwards.
6. Insert the card into its housing inside the battery compartment, directly underneath the battery location.
7. Press lightly on the card to ensure it is firmly in place.
8. Replace the batteries into the compartment, as described in step 3 of par.4.2.b.





(B) (C)

5. The first time you use your MAP 500

5.1 Turning MAP 500 on/off

To turn the receiver on/off, hold down the button for at least 2 seconds.

Important! If this is the first time turning on your GPS, you will be required to follow the initialization procedure outlined in par. 5.2.

5.2 Initialization of GPS receiver

As with all GPS receivers, MAP 500 must automatically establish its position the first time it is turned on. This operation is called initialization, and MAP 500 must follow this procedure each time you travel a large distance (more than 500km) while the receiver is turned off, or when the receiver hasn't been used for more than one month.
The first time you use your MAP 500, this procedure will take a few minutes. The next time you use the GPS, this will not be necessary as the device will be able to locate its current position much more quickly. Each time you use the GPS after the first time, you will need only to turn on the GPS, as described in par. 5.2.a, and wait for it to establish its position, as described in par.5.2.c.
This procedure has three steps that must be followed, in the order given below:

- Positioning and first start up
- Initialization
- Establishing of position

5.2.a Positioning and first start up

To initialize your receiver, proceed as follows:

1. Find a place outdoors which has a wide view of the sky, with as few obstacles (buildings, radio towers, plants, etc.) as possible. Adjust your GPS so it is facing upwards and is at a 45-degree angle from the ground.
2. Hold down the button for at least two seconds: a welcome page will appear briefly and will contain various information, including the version of the installed map. After this, another warning screen will appear (B), requesting that you press the ESC button to confirm:
3. Press the ESC button to accept and turn on the receiver. The **Satellites** page (C) will come up on the screen (described further along):

5.2.b Initialization

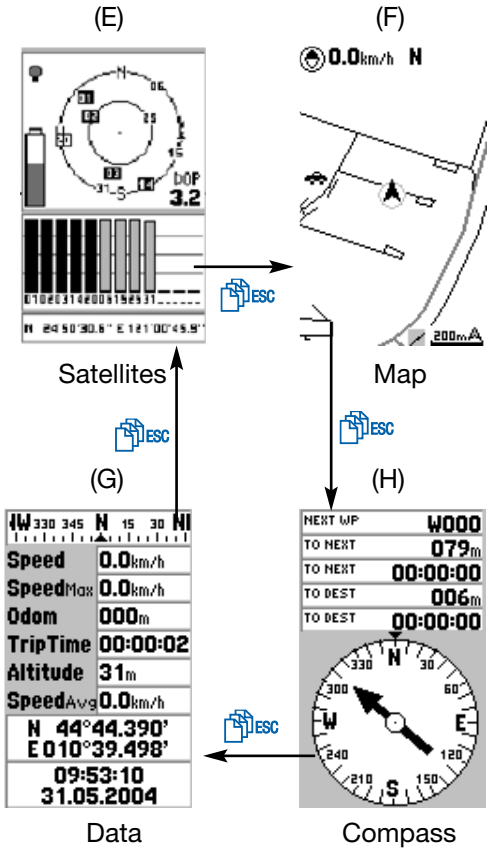
1. Press the button twice, or press once and move the Joystick up or down to highlight **Main Menu**, and press to confirm. The main menu will appear (D).
2. Move the Joystick up or down to select **Cold Start** (initialization), then press the button to confirm: the receiver will be initialized and the **Satellites** page will appear on the screen again, now with the message **Acquiring Sats** on the bottom of the screen.
3. As the satellites are located, the page will fill up with new data and symbols. For further details on the **Satellites** page, refer to par 8.1.

(D)

5.2.c Establishing your position

1. Once at least three satellites have been located, the coordinates for your position will appear on the bottom part of the screen, and the **Map** page will automatically come up. For further details on this page, refer to Ch. 8.2.
2. The GPS is now ready to navigate, as the **Map** page shows your position and direction on the map displayed. However, there are many options available for MAP 500, so we suggest continuing through this manual in order to gain a clearer understanding of the various instructions on how to use your GPS to the fullest. In particular, we suggest reading through the settings described in par. 7.1.

At step 3, if you do not press ESC within one minute, the receiver will automatically turn off.



6. Main pages

Necessary information on MAP 500's various functions is contained in four main pages:

- **Satellites** (E) – monitors GPS satellite signals, as described in the previous paragraph. For further details, refer to par.8.1.
- **Map** (F) – indicates your position in relation to the map displayed on your receiver, the route that you are following, the reference points (waypoints), and other geographical details. For further information, refer to par.8.2.
- **Data** (G)– displays in detail the data received from the GPS system: position, velocity of movement, distance travelled, time lapsed from the start of the trip, time remaining to the end of the trip, altitude, etc. For further details, refer to par.8.3.
- **Compass** indicates direction (H) – this page is similar to a compass in that it indicates the direction of movement and other parameters that are useful for reference during movement. For further details, refer to par.8.4.

The image representations shown in this manual can deviate from this description depending upon software version of ALAN MAP 500. The description applies to software conditions of operating system 2.02ZA.

6.1 Selecting the main pages

To scroll cyclically through the various pages, briefly press the ESC button continuously until you reach the desired page. Pages are displayed in sequence exactly as on the side.

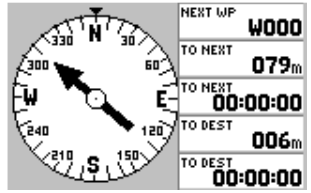
For further information on the details of each page, prefer to Ch.8.

6.2 Rotating the main pages

You can rotate viewing of the display in order to better use the longer side of the display (I). In some situations, this is very convenient, particularly when viewing the **MAP** page. To rotate a page, hold down the ESC button until the screen rotates (in the example below, the **COMPASS** page is rotated).

Be careful not to confuse this function with the one described in the previous paragraph: briefly pressing the ESC button selects a page, while holding down the button rotates the page.

ESC
(hold down)



(I)

6.3 Display backlighting

If ambiental lighting is not adequate for viewing the display, press the button to light up the display. Pressing the button again will deactivate the backlighting. The backlighting, deactivated after a determined period of time, is enabled everytime any button is pressed. For further information, refer to par. 7.1.

Backlighting speeds up battery consumption; use this feature only when necessary.

When using the Satellites page, backlighting is displayed as active as described in par.8.1.

6.4 Adjusting display contrast

You can adjust the display contrast to optimize visibility in various lighting conditions.

1. Go to the **Satellites** page (if you are not already in this page, continue pressing ESC until you have reached it).
2. Move the Joystick left or right respectively to reduce or increase the contrast. When using this function, the display will show the contrast level selected with .
3. Press the ↵ button to confirm or ESC to exit without saving the new contrast setting.

(J)

7. Navigating the command menus

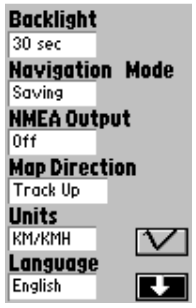
Each page displays a series of options and settings, accessed through the command menu. The procedure for navigating the menus is as follows:

1. Press the (menu) button: the display will show the menu options for the selected page; for example, the following options (J) are found under the **Map** menu:
2. Move the Joystick up/down to highlight the desired option.
3. Press ↵ (confirm) to activate the option.
4. Select other options as desired, repeating steps 2 and 3, as will be further described ahead in the paragraphs outlining each function. When using this function, you can go back to a previous level by pressing ESC.

__Important__! The last two options, __Setting__ and __Main Menu__, are available on every page and allow for, respectively, personalizing your GPS (backlighting mode, map orientation, units of measurement, etc) and for quick access to frequently used functions (geographical reference settings, routes, etc). Use of the __Setting__ and __Main Menu__ menus is described in par. 7.1 and 7.2.

Pressing twice quickly provides quick access to the Main Menu from any page.

Occasionally, you will be asked to confirm or cancel settings you have selected, pressing the check or cross buttons respectively. These functions can be enabled using the Joystick and the ↵ button.



(K)

7.1 Menu Setting

This menu (K) allows the user to personalize their receiver according to their needs and for optimum function of the device. This can be called up from any main page, as described above.

The following options are explained in further detail below:

- **Backlight** (display backlighting time)
- **Navigation Mode**
- **NMEA Output**
- **Map Direction**
- **Units**
- **Language (Menu in 6 different languages)**

Over the arrow you arrive at the next page for further attitudes. To modify an option:

1. From any page, press , then select **Setting** using the Joystick.
2. Press ↵ to confirm.

3. Move the Joystick up/down to highlight the desired option (e.g., Map Direction) and press ↵. A list of available settings will appear (e.g., Track Up/North Up).
4. Move the Joystick up/down to select the desired option (e.g., North Up) and press ↵.
5. If necessary, repeat steps 3 and 4 to change settings as required.
6. Use the Joystick to highlight [V] and press ↵ to confirm. Don' t forget this step, otherwise no storage of settings takes place!

At step 6, pressing ESC will exit the menu without saving the settings (in case of error).

7.1.a Backlight (backlight time)

Selects the automatic backlight deactivation time (is activated each time by pressing the button). Settings available are: **30 sec, 3 min, 10 min, Always.** With the last setting, you will be required to manually deactivate the backlighting by pressing a second time. The backlight, deactivated after a determined period of time, is enabled at any button pressure.

*In **Simulate** mode, this setting is not activated: the backlighting is always enabled.*

7.1.b Navigation Mode

Select the navigation mode for the receiver, based on the battery consumption. The available settings are:

- **Normal** – maximum settings (rapid updating of data on the display) with normal consumption.
- **Saving** – reduced settings (data is updated on the display more slowly) with reduced battery consumption.
- **Simulate** – GPS receiver deactivated with minimum battery consumption. Navigation is not possible in this mode; the only options available are the changing of settings and viewing of maps.

*In **Simulate** mode, this setting is not activated: the backlighting is always enabled.*

7.1.c NMEA Output

Data acquired from the satellites can be taken from the NMEA data output (**Data** socket) using an (optional) interface cable. The data can then be elaborated using a laptop computer or other NMEA 0183 compatible data interface device (e.g., transceiver, mapping instrument, etc). The available settings are:

- **Off** (interface excluded) – MAP 500 functions normally without sending data to the interface.
- **On** (interface active) – data are sent with an update frequency of once per second at a velocity of 4,800 bps, and in the GGA, GSA, GSV, RMC formats. In this state, the option of downloading maps or other data to the GPS via the cable and optional software is deactivated.

Activation of the interface is advised only when necessary, because when it is active, the data update frequency on MAP 500's display is slightly slower.

When using the NMEA ON interface, you cannot enter into navigation mode ***Simulate****.*

In order to have the serial port properly working even when the NMEA output is deactivated, we suggest you switch ALAN MAP500 off and then on.

7.1.d Map Direction

Orientation of the displayed map can be changed on the Map page as follows:

- **Track Up** – the map is automatically oriented towards the direction in which you are moving. The map rotates at 45° steps to maintain this orientation. In this mode, the icon in the top left corner of the display will constantly show North as the dark part.
- **North Up** – the map is always oriented towards North.

7.1.e Units

This setting determines the units of measurement used by MAP 500:

- **Mi/MPH** (Miles/Miles per Hour) – for use in Anglo-Saxon countries
- **KM/KMH** (KM/KM per Hour) – for land navigation in non-Anglo-Saxon countries.

7.1.f Language

With this feature, you set the language of the GPS menus (Italian, English, Spanish, Dutch, German, French)

7.1.g DMS Format (on the second Setup page after clicking on the arrow)

The attitude for the view settings (traditionally) degrees, minutes, seconds of DD MM SS.S or in the today wide-spread decimal minute mode of DD MM.M. (K-a)

(K-a)

7.1.h WAAS / EGNOS

Activates the setting for the additional indicator correction by special geostationary satellite signals.

- **On**- additional satellite signal correction is switched on (in case of receiption appears DGPS)
- **Out** - without additional correction signal this setting is always recommended if user does not know exactly whether a WAAS or a EGNOS signal is receiptable at present. (K-b)

(K-b)

7.2 Main Menu

This menu (L) can be called up from any page, as described in par.7, and allows for quick access to frequently used functions (geographical reference settings, routes, etc).

Main Menu options are explained in detail below:

- **Waypoints** (geographical references) – creation and use of geographical references (waypoints). For information on their use, refer to Ch. 9.
- **Routes** – creation and use of routes composed of various waypoints. For information on their use, refer to Ch. 10.
- **Track log** – for automatic tracking of the route followed (independently of the route programmed in Routes). For information on use, refer to Ch.11.
- **Cold Start** (initialization). Details are described in par. 5.2.
- **About** (information) – viewing of map version, map utilised, software version, and other data from the receiver. Refer to par.7.2.a.
- **Change Format** – viewing of the coordinates using various systems. Refer to par. 7.2.b.
- **Change Datum** – variation of references with which the maps are made. Refer to par.7.2.c.
- **Loading** (downloading of data) – for transferring data (maps, waypoints, routes, tracks, etc) from a PC to your GPS, and to update MAP 500's operating system using optional software and cables. For further information, refer to the instructions supplied with these accessories.

To modify an option:

1. From any page, press twice to call up the main menu shown above, or press once, highlight **Main Menu** with the Joystick, and press ↵.
2. Use the Joystick to select the option desired.
3. Press ↵ to confirm.

Follow the directions in the paragraph below regarding the option selected.

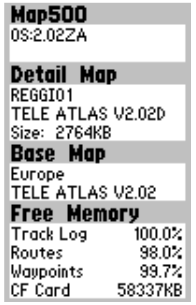
7.2.a Viewing of system information

You can view the system information as follows:

1. From any page, press the button twice, or press the button once, then highlight **Main Menu** with the Joystick and press ↵. The display will show (L).
2. With the Joystick, highlight **About** (information) and press ↵. A page (M) will appear showing various information, such as the memory used for the various functions, free memory, version of operating system, maps downloaded, etc.
3. When you are finished viewing the information, press ESC to return to the main menu.

(L)

(M)



7.2.b Changing Coordinate format

Normally, latitude and longitude are used to define a geographical position, although other systems exist which may be selected for special applications. In addition, you can still choose further internationally used systems, e.g. the German Gauss Krueger system, the Austrian, Swiss, the British and the UTM system, who are automatically linked with the associated map data. The basic adjustment is recommended only if it is necessary to change the coordinate format:

1. Follow the steps described in the previous paragraph, selecting **Change Format** at step 2.
2. Use the Joystick and the ↵ button to select the standard desired. Return to the main menu.

7.2.c Changing Datum

Maps are created using different standards. The most common one is **WGS-1984** (World Geodetic System 1984), used by most GPS. For this reason we suggest not changing it as long as it suits your particular needs, as selecting an incorrect standard may result in measurement errors. To select other standards:

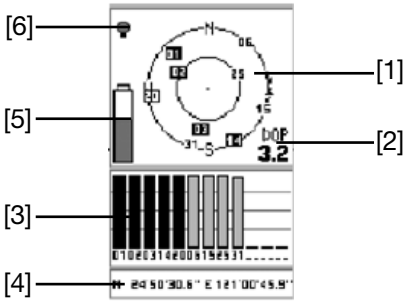
1. Follow the steps described in the previous paragraph, selecting **Change Datum** at step 2.
2. Use the Joystick and the ↵ button to select the standard desired. Return to the main menu.

Ch. 18 contains a complete table of available references.

8. Description of main GPS pages

8.1 Satellites page

The **Satellites** page shows the acquisition of satellites by the receiver and is useful for optimizing the antenna's directional pointing. Refer to the diagram (N):



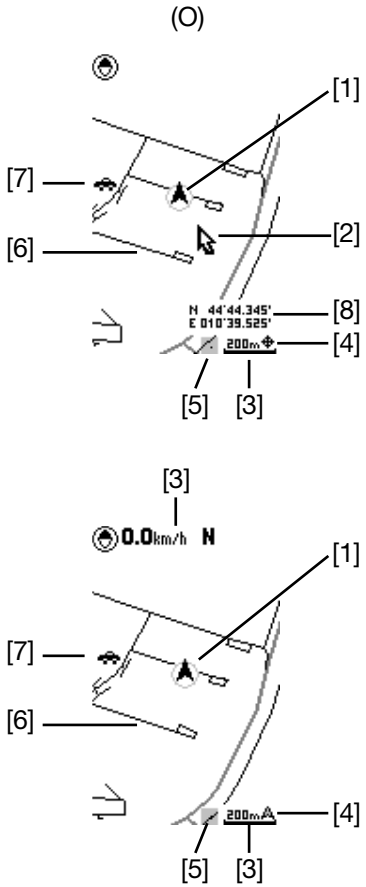
(N)

1. **Concentric circles** – represent the approximate position of each satellite (orientation towards North) relative to your position. The two circles indicate the elevation (the external one represents the horizon, the internal one a 45-degree angle from the horizon). The centre of the internal circles indicates the perfectly vertical position. The numbers which appear are the identification numbers of the satellites received. The dark numbers represent the acquired satellites (from which you can read data). In this example, satellites **01**, **02**, **03**, **14** and **20** are acquired. Satellite **02** is at 45° from you and number **14** is on the horizon.
2. **DOP** (Diluition Of Position) – indicates errors introduced to the system.
3. **Vertical bars** – represent the signals of the satellites received. Below each one appears the identification number of the satellite, its length being proportionate to the intensity of the signal received. The dark bars indicated satellites acquired.
4. **Coordinates of your position/DGPS** – appear once the GPS has acquired at least 3 satellites (at least three dark bars must appear, as described in the above paragraph) or DGPS is displayed if WAAS or EGNOS signal has been received.
5. **Battery icon** – indicates the remaining battery power. For further details, refer to par. 4.3.a
6. **Backlight icon** – indicates if display backlighting is active. When it is dark, the backlighting is deactivated; when it is light, it is activated. For further details, refer to par.6.3.

*It is important to keep in mind satellites are being acquired only if **Acquiring Sats** appears at the bottom of the display. If **Simulation** appears, you will need to change the navigation mode, as described in par. 7.1.b.*

During the satellite acquisition phase, it is possible to monitor the signal and optimize the pointing of your antenna to lengthen the bars and hasten the acquisition process.

*If the message **Poor GPS Signal!** appears, check that there are no obstacles above you that might impede MAP 500's reception of the satellite signals (tree branches, beams, poles, etc). In particular, do not use this function while inside a building or vehicle (without at least using an external antenna). Press ↵ to confirm, move to a more open area, and try the procedure again.*



Press the (menu) button to access the following options:

- **Navigation/Stop Navigation** – for selecting navigation or simulation mode. For further details, refer to par. 8.1.a.
- **Setting** – for access to the settings menu. For further details, refer to par. 7.1.
- **Main Menu** – for access to the main menu. For further details, refer to par. 7.2.

To select the desired option, use the commands described in par. 7.

8.1.a Navigation/Stop Navigation

If you do not need to actually navigate, but are only using your receiver to enter settings or consult maps, we suggest you deactivating the receiver by entering **Simulation** mode. This mode considerably reduces the battery consumption. Navigation activates navigation, while **Stop Navigation** deactivates it by selecting simulation mode. When **Simulation** mode is activated, this will be displayed at the bottom of the **Satellites** screen in the place of your coordinates.

From the **Satellites** page, you can switch from Navigation to Simulation without entering the **Settings** menu: press highlight **Navigation** or **Stop Navigation** (Simulation mode) and press ↵ to confirm.

8.2 Map page

This page shows your position and direction of movement, shown by the symbol inside the GPS' memorized map. In this map, you can create geographical references (waypoints) or routes as desired. For further details, refer to par. 9 and 10.

The **Map** page includes the following details (O):

1. **Direction and current position** – The symbol shows the current position and the angle of direction of movement (displayed either towards North or towards a preset destination, as described in par. 7.1.d). This is obviously different from a traditional compass as it indicates direction only during movement. Furthermore, if the symbol is dark, this means that you have acquired the minimum three satellites necessary for navigation, otherwise position your GPS better for acquisition.
2. **Cursor** – A useful instrument which allows you to verify the coordinates of a point by simply moving the cursor to that position using the Joystick. The cursor also allows you to move the displayed area of the map: just move the cursor close to the edge of the map and that part of the map will appear on the screen.
3. **Scale of map, position coordinates, direction and speed** – Scale and coordinates of position are shown right down in the display, direction and speed are indicated above in the left corner of the display. The following functions can be implemented:
   - **Change the scale** – briefly press the zoom ⊕ and ⊖ buttons to increase or decrease the scale. The scales available are: 50m – 200m (0.2miles) - 500m (0.5miles) – 1Km (1mile) – 2Km (2miles) – 5Km (5miles) – 25Km (25miles) 100Km (100miles) – 200Km (200miles).

- **Fade in/out Scale, coordinates, direction and speed** – hold pressed the ⊕ key for approx. 2 seconds.

4. **Viewing mode** – The symbol on the bottom right, beside the scale, constantly displays the active viewing mode of the map:
   - ▲ **Navigation mode** – the display indicates the area relative to your current position. The cursor is not shown, but as soon as you move the Joystick, it will appear close to your current position.
   - ⊕ **View map mode** – the display indicates another area different from that of your position. The cursor is always visible to allow you to move between different areas of the map, and to use various functions.

   You can switch between the two modes by briefly pressing ↵. This provides quick movement from the area viewed in which you are travelling to a place where you are going, and vice-versa. This allows you to check the information on any place while keeping an eye on navigation, as desired.
5. **Map viewing reference** – When you enlarge/reduce the map, the black point inside the grey square changes format and position depending on the settings, representing the size and position of the viewed area with respect to the entire map.
6. **Streets** – Normally, the **Map** page also shows the streets memorized in the electronic map. If you wish to hide/unhide these streets, hold down the ⊖ button for two seconds.
7. **Reference icons** – Indicates the presence of various cartographic points pre-programmed into the map: airports, railway stations, hotels, restaurants, etc. These symbols can be made to appear/disappear individually on the map as described in par 8.2.g.

Pressing the (menu) button, you can access the following options by highlighting them with the Joystick and activating them with ↵.

- **Search Object** – Searches for a determined pre-programmed reference on the map (city, street, hotel, airport, etc). For further details, refer to par. 8.2.a.
- **Set Location** – Sets the place selected by the cursor as the current position. For further details, refer to par. 8.2.b.
- **Nearest Search** – Searches for the nearest pre-programmed reference on the map. For further details, refer to par. 8.2.c.
- **Nearest WPT** – Searches for the nearest waypoint. For further details, refer to par. 8.2.d.
- **Show MapInfo** – Displays information on the place indicated by the cursor. For further details, refer to par. 8.2.e.
- **Shortcut On/Off** – Draws a line which connects your current position to the one indicated by the cursor. For further details, refer to par. 8.2.f.
- **Display Icons** – Defines which reference icons pre-programmed on the map should appear. For further details, refer to par. 8.2.g.
- **Show Dist On/Off** – Shows the distance between two or more points. For further details, refer to par. 8.2.h.
- **Setting** – For access to the settings menu. For further details, refer to par. 7.1.

- **Main Menu** – For access to the main menu. For further details, refer to par. 7.2.

To select the desired option, use the commands as described in par. 7.

8.2.a Search Object

For searching the reference symbols (e.g., city, streets, hotels, restaurants, schools, hospitals, railway stations, etc) pre-programmed on the map. Follow these steps:

1. When you have activated this option, select Select Region. Highlight the area of interest (e.g., **Italy**) and press ↵ to move to the next level.
2. The display will show **Select A Type**, followed by a list: **City, Road, Hotel, Restaurant, Airport,** etc.
3. Move the Joystick down/up to highlight the reference type desired (e.g., Airport) and press ↵. In the example, a list of Italian airports appears in alphabetical order.
4. Move the Joystick down/up to select the reference (airport) which you would like to locate and press ↵ to confirm. Data for the selected reference will appear on the display (e.g., the direction with respect to your position, the telephone number, etc).
5. Move the Joystick down/up to highlight , and press ↵ to confirm. The cursor will move to the desired reference in viewing mode **View Map**.

8.2.b Set Location

When you are in **Simulation** mode (and therefore not actually navigating), the GPS shows the last position received. If you wish to change this position in order to measure something, for example, move the cursor to a new location and activate the command **Set Location**. The symbol will show the new position.

8.2.c Nearest Search

This function is similar to **Search Object**, which allows the user to search for the same type of pre-programmed map reference, this time selecting references closest to you. To activate:

1. When you have activated this option, select **Select A Type**, followed by a list: **City, Road, Hotel, Restaurant, Airport,** etc.
2. Move the Joystick down/up to highlight the reference type you are searching for (e.g., Airport) and press ↵.
3. Press . **Distance** will appear on the screen.
4. Press the ↵ button. This will activate a menu which will allow you to select the search ray from your position (up to 5 Km or 5 miles).
5. Move the Joystick up/down to select the distance, then press ↵. All references (of the previously selected type) within the radius defined in the last step will appear.
6. Move the Joystick down to highlight the reference desired, then press ↵. The cursor will move to the desired reference in

viewing mode **View Map**.

Search results are influenced by settings made in par. 8.2.g.

8.2.d Nearest WPT

For searching for the closest waypoint to your position (for further details, see Ch. 9). Using this feature is very simple: from **Map** mode, press , highlight **Nearest WPT**, and press ↵. The cursor will move to the closest waypoint, in viewing mode **View Map**. If you want to navigate instead to any other waypoint (not on the straight selected route), use the GOTO function. Further details are described in the section 9.2.5 and/or. 9.2.7

8.2.e Show MapInfo

For viewing information regarding a geographical reference (street, city, etc) indicated on the map:

1. In **Map** mode, use the Joystick to move the cursor to a reference on the map.
2. Press and highlight **Show MapInfo** using the Joystick, then press ↵. The display will show available information (e.g., direction and distance from your current position).

8.2.f Shortcut On/Off

This function traces a line showing the shortest route between your position and any location.

1. In **Map** mode, use the Joystick to move the cursor to the location desired.
2. Press and highlight **Shortcut On** using the Joystick, then press ↵. The display will show the shortest route towards the location with a _.-.-._ line (dash and dot).

*To deactivate this function, repeat the two steps, selecting **Shortcut Off** at step 2.*

*This function is disabled when **Set Navi** (navigation using routes) is activated, as described in par.10.2. In this case, to use the shortcut function, deactivate the navigation using the **Cancel** Navi command (deactivation of navigation using routes).*

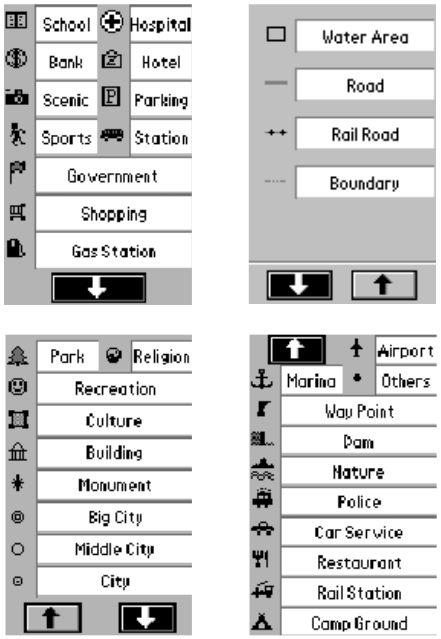
8.2.g Display Icons

This function allows you to show/hide various reference symbols on the map (e.g., streets and cities of various sizes, schools, hospitals, railways, etc). This allows you to hide symbols which are not necessary, and to show other symbols which you require.

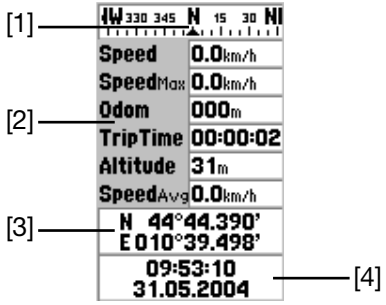
1. In **Map** mode, press and highlight **Display Icons** with the Joystick, then press ↵. The display will show a list of all the symbols. Beside each symbol is a box which, if checked, activates the display of this symbol on the map (P).
2. Use the Joystick to highlight the **?** button and press ↵. This will allow you to read in more detail the meaning of each symbol

(P)

(Q)



(R)



(Q), which you can change by selecting the various arrow buttons on the Joystick, and then pressing ↵.

3. After reviewing the various meanings of symbols, press to select one of the following options:
   - **Hide All/Show All** to hide/show all of the symbols
   - **Hide Points/Show Points** to hide/show all of the symbols, except those for streets
   - **Hide Roads/Show Roads** to hide/show all except the symbols for streets
4. At this stage, if you wish to hide/show only some of the symbols, you can move the Joystick to the symbols you wish to change and press ↵ to hide/show the check mark.
5. To memorize the settings and exit this function, use the Joystick to highlight and press ↵ to confirm. In case of error, you can also exit without memorizing the settings by highlighting X.

8.2.h Show Dist On/Off

This function allows you to measure the distances between various points on the map (a maximum of 5). This function is very simple to use:

1. Press and select **Show Dist On**, then press ↵ to confirm.
2. Use the Joystick to move the cursor to the first point, then press ↵. **0** will appear beside the cursor.
3. Move the cursor using the Joystick. Note that a dotted connecting line ----- is drawn and that the distance from the first point is displayed.
4. Once you've reached your second point, press ↵ to hold the point and keep the measured distance on the map.
5. Repeat steps 3 and 4 to measure a second line drawn from the second point to a third point, and so on up to a maximum of 5 points.
6. Once you have finished, you can delete the line from the map by following step 1 again and selecting **Show Dist Off**.

8.3 Data page

The **Data** page shows in detail the data received from the GPS system (position, velocity of (position, velocity of movement, distance traveled, elapsed time from the start of the voyage, altitude, etc), as well as allow you to change some settings. The references are the following (R):

1. **Direction** – shows your direction of movement
2. **Data**
   - **Speed** shows the current velocity
   - **Track** shows the direction
   - **Odom** (odometer) shows the distance traveled from the beginning of the trip
   - **Trip Time** shows the elapsed time from the beginning of the trip
   - **Altitude** shows the altitude

- **Speed AVG** shows the average speed measured from the beginning of the trip

3. **Coordinates** of your current position
4. **Time and date**

Pressing the button will give you access to the following options, which you can highlight with the Joystick and activate by pressing ↵.

- **Change Time** – Setting for time difference with respect to the Greenwich meridian. For further details, refer to par. 8.3.a.
- **Trip Reset Time** – For resetting the trip start time. For further details, refer to par. 8.3.b.
- **Setting** – For access to the main settings menu. For further details, refer to par. 7.1.
- **Main Menu** – For access to the main menu. For further details, refer to par. 7.2.

8.3.a Change Time

The Navstar Satellite constellation allows your MAP 500 to read data and time with extreme precision.Time is based on the Greenwich meridian, so if you are located in another time zone, you will be obliged to insert a time zone difference (for Italy an hour more). To use this setting:

From the Data page, press and use the Joystick to select Change Time, then press ↵. The page (S) will appear:

Current Time and **Adjust Time**, composed of:

- **Plus/Minus** – defines if the time zone difference is plus or minus Greenwich Mean Time.
- **Hour** – hours of difference with respect to the Greenwich meridian
- **Minute** –minutes of difference with respect to the Greenwich meridian (for use only in special applications)

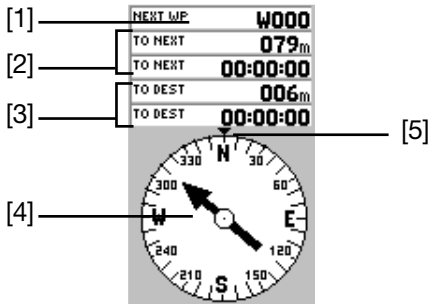
1. Use the Joystick to move to the field you are modifying and press ↵ to begin the modification.
2. Move the Joystick up/down to change each number and left/right to select the number to change (the **Current Time** field changes as a consequence).
3. Press ↵ to confirm the modification.
4. Repeat steps 1 through 3 for each field you are modifying.
5. Once you have finished, use the Joystick to highlight and press ↵ to confirm. The hour will be updated using the desired time zone difference.

(S)

8.3.b Trip Reset Time

MAP 500 is equipped with a special timer which records when you begin using your receiver to navigate and uses this to derive certain information (e.g., average trip speed, distance travelled from the beginning of the trip, etc). Obviously, to receive accurate information from this data, you must reset the timer when you begin a new trip. To use this function, go to the **Data** page and press . Using the Joystick, select **Trip Reset**, then press ↵. The timer will be reset and all of the new data will be displayed correctly.

(T)



8.4 Compass Page

When you are navigating using a route, the **Compass** page helps to hold your course with respect to the next waypoint by indicating the direction of movement, the distance, and other useful parameters which help you to maintain the set route. For further details regarding routes, refer to par. 10.

The references are as follows (refer to the diagram T):

1. **NEXT WP** - Shows the designation of the nearest waypoint (route) and/or selected waypoint (GoTo, lower picture).
2. **TO NEXT** – these two fields show the distance to the next waypoint and the estimated time of arrival.
3. **TO DEST** – these two fields show the final distance and the estimated time of arrival.
4. **Compass needle** – shows the direction of the next waypoint.
5. **Direction indictor** – shows the direction of navigation (the circle with the cardinal points underneath moves below it).

Pressing the (menu) button accesses the following options, which you can highlight with the Joystick and activate using ↵.

- **Change Next WP** – For selecting a different waypoint than the one chosen in order to monitor the various legs of the route. For further details, refer to par. 8.4.a.
- **Setting** – For access to the settings menu. For further details, refer to par. 7.1.
- **Main Menu** – For access to the main menu. For further details, refer to par. 7.2.

To select a desired option, use the commands described in par. 7.

8.4.a Change Next WP

When you reach a waypoint, you will want to monitor the data for the next waypoint. Using this command, you can switch to any waypoint on the route.

1. Press and highlight **Change Next WP** with the Joystick, then press ↵. The display will show the list of previously-selected waypoints along the route.
2. Move the Joystick down/up to highlight the waypoint you wish to monitor, then press ↵. The references on the **Compass** page will be updated with this new information.

This command is not active if a route is not previously programmed and selected. For further details on routes, refer to par. 10.

9. Waypoint

Waypoints are geographical references along a route which can be created at will and used for orientation during a trip towards a destination. The user can do many things with a waypoint, for example give it a name and add it to a route. MAP 500 can memorize up to 1000 waypoints for use individually or along a route. For further details, refer to Ch. 10.

9.1 Creating a waypoint

There are two methods to create a waypoint: using the menu, or during navigation.

9.1.a Method 1 – using the menu

1. From any page, press the button twice, or press once, highlight **Main Menu** with the Joystick, and press ↵. The display will show (U):
2. Using the Joystick, highlight **Waypoints** and press ↵. A list of previously programmed waypoints will appear (V).
3. Press . The display will show (W).
4. Using the Joystick, highlight **New** and press ↵. The display will prompt you to enter a waypoint as follows (X):
5. A waypoint is composed of a number of fields (from top to bottom):
   - **Name** (name of the waypoint) is written with a W followed by a progressively higher number
   - **Comment** to add reminder comments (e.g., obstacle)
   - **Current Coordinates** (in this example, N 52°29'11.0" and E013°32'19.7")
   - **The date and time of creation**
   - **Active** is a box which, if checked, displays the waypoint on a map, otherwise the waypoint only appears on the list
   - **GOTO** - You can activate this field, if you like to navigate directly to the selected waypoint without using a route.
6. If you wish to change a field, (for example the name or coordinates), follow the procedure described in step two of par.9.2.
7. Once you have finished, use the Joystick to highlight and press ↵ to confirm, or exit without memorizing the waypoint by highlighting X and pressing ↵.

(U)

(V)

(W)

(X)

(X)

(Y)

(Z)

(A1)

(B1)

9.1.b Method 2 – during navigation

1. On the **Map** page, use the Joystick to move the cursor to the desired position.
2. Hold down ↵ for at least one second. The screen shows (X).
3. Follow the steps from 5 onwards, as described in Method 1.

9.2 Modifying a waypoint and immediate selection over GOTO function

If you wish to modify a waypoint that has previously been programmed, follow this procedure:

1. From any page, press twice or just once, select **Main Menu** with the joystick and press ↵ (Y).
2. Move the joystick down to highlight **Waypoints** and press ↵. The entire list of all waypoints will be displayed (Z).
3. Press ↵: you will enter the waypoint list and can then select a specific one (A1)
4. Move the Joystick up/down to highlight the desired waypoint and press . A list of commands will appear:
   - **New**
   - **Edit** (the GoTo selection field will be integrated with operating system starting from version 1.03)
   - **Delete**
   - **Delete** All
   - **GOTO** – (direct view of the selected waypoint in the map)
5. Move the Joystick up/down to highlight **Edit** and press ↵ to confirm. The following screen will appear (B1):
6. A waypoint is composed of a number of fields (from top to bottom):
   - **Name** (name of the waypoint) is written with a W followed by a progressively higher number
   - **Comment** to add reminder comments (e.g., obstacle)
   - **Current Coordinates** (in this example, N 52°29'11.0" and E013°32'19.7")
   - **The date and time of creation**
   - **Active** is a box which, if checked, displays the waypoint on a map, otherwise the waypoint only appears on the list
   - **GOTO** - this selection field appears starting from version 1.03 under EDIT (see further above 9.2.5., fig. B1)
7. Move the Joystick up/down or left/right to highlight the field being modified (e.g., **Name**) and press ↵ to modify: the first character in the field will be highlighted.
8. Move the Joystick left/right to select a character from the field, then move the Joystick up/down to change the character.
9. As desired, repeat the previous step to change each character in a field, then press ↵ to confirm.
10. Change other fields by repeating steps 5 through 7.
11. Once you have finished, use the Joystick to highlight and press ↵ to confirm, or exit without modifying the waypoint by highlighting and pressing ↵.

The Active Attivo box can only be checked or unchecked by pressing the ↵ button.

In step 1, if you have a long list of waypoints, you can narrow the search, as described in par.10.

Waypoints added to the list may be marked with an asterisk on their right-hand side. This indicates that they have been added to a route. For further details on routes, refer to par. 10.

9.3 Deleting one or more waypoints

If you wish to delete a previously programmed waypoint:

1. Follow steps 1 through 4, as described in par.9.2.
2. Follow step 5, selecting the **Delete** command and press ↵. The display will request that you confirm this, with **Are you sure?**
3. If you wish to delete the waypoint selected, press ↵, otherwise press ESC to exit without deleting the waypoint.

This function will not allow you to delete a waypoint marked with an asterisk. This symbol indicates that this waypoint has been inserted in a route. If you wish to delete it, you must first remove it from the route, as described in par.10.6.

9.4 Deleting all waypoints

If you wish to delete all previously programmed waypoints:

1. Follow steps 1 through 4, as described in par. 9.2.
2. Follow step 5, selecting the **Delete All** command and press ↵. The display will request that you confirm this, with **Are you sure?**
3. If you wish to delete all the waypoints, press ↵, otherwise press ESC to exit without deleting the waypoints.

This function will not allow you to delete waypoints marked with an asterisk. This symbol indicates that these waypoints have been inserted in a route. If you wish to delete them, you must first remove them from the route, as described in par.10.6.

(Y)

9.5 Narrowing waypoint list

If you have a number of waypoints programmed, you can narrow the list to reach the ones you wish to modify or delete more easily.
For example, when at step one in par.9.2, you see a list of waypoints (Y):

1. Ensure the **Name** field is highlighted, as described above (not the list of waypoints), and press ↵.
2. Use the Joystick to change the characters in the **Name** field to view only the waypoints which contain the same characters in the same position on the list. The character _ (underscore) automatically accepts any character.
   Example: you have 5 waypoints with these names:
   - **W001**
   - **W002**
   - **PORT**
   - **HOME**
   - **LIGHTHOUSE**

If you insert _ **O** _ _ _ _ _ _ into the **Name** field, you will see only the waypoints **PORT** and **HOME** (because the second letter is O); if instead you insert **W** _ _ _ _ _ _ _ into the **Name** field, you will only see the waypoints **W001** and **W002**.

10. Routes

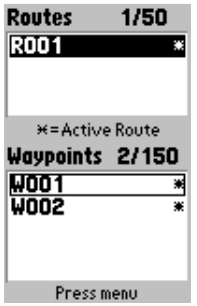
Routes consist of two or more waypoints which define the route towards a destination. You can create up to 50 routes on your MAP 500, each with a maximum of 150 waypoints. This function is useful in guiding you from the first waypoint on your route to each subsequent waypoint, through to the end of your trip. When navigating along a pre-defined route, MAP 500 highlights this on the **Map** and **Compass** pages (for further details, refer par. 8.2 and 8.4). You can also select which waypoint to use as a reference point, using the function described in par. 8.4.a.

10.1 Creating a route

1. Ensure that you have at least two waypoints programmed.
2. *From any page*, press twice, or press once, highlight **Main Menu** with the Joystick, and press ↵. The display will show (C1):
3. Using the Joystick, highlight **Routes** and press ↵. The list of previously programmed **Routes** will appear (D1) (in the example, route R001 is created using waypoints W001 and W002):
4. Press . The display will show the available options on the **Routes** menu (E1):
5. Using the Joystick, highlight **New** and press ↵. The display will prompt you to create a new route (F1):
6. A waypoint is composed of a number of fields (from top to bottom):
   - **Name** (name of the route) is written with an R a progressively higher number (in the example R002)
   - **Comment** to add reminder comments (e.g., home-work)
   - **Date and Time of Creation**
7. If you wish to modify a field (for example the name), use the Joystick to highlight the field and press ↵, then move the Joystick left/right to select the character you wish to modify, and up/down to modify it. Once you have finished, press ↵ to confirm.
8. Press . The display will show the options available (G1):
9. Use the Joystick to highlight **Add WP** (add waypoint – when creating a route, this is the only option available) and press ↵. The display will highlight the entire list of previously programmed waypoints. Press ↵ again.
10. You can now select an individual waypoint by moving the Joystick up/down. Once you have selected the first waypoint, press ↵: you will see a 1 to the right of the waypoint; this is the first reference, and is used as a starting point.
11. Add other waypoints by repeating step 10. You will note that waypoints will be assigned progressively higher numbers which will determine the order in which the waypoints are used (the highest number will be the trip destination point). To remove a waypoint from the route, select it and press ↵ again.
12. Once you have finished, press ESC to exit.
13. Move the Joystick down to highlight and press ↵ to confirm. The display will show the route created (in the exam-

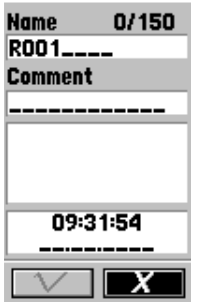
(C1)

(D1)



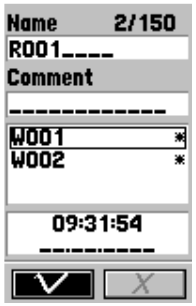
(E1)

(F1)

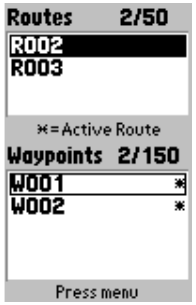


(G1)

(H1)



(I1)



(J1)

(L1)

ple, R002) with the inserted waypoints (H1)

14. Move the Joystick to highlight [✓] and press ↵ to confirm.
15. Press ESC to return to the main screens.

To use the route during navigation, follow the instructions outlined in the next paragraph.

10.2 Activating a route for navigation

To navigate using a previously programmed route:

1. Enter the Routes **menu** (steps 1 through 3 in the previous paragraph. The display (I1) will show a list of programmed routes:
2. Move the Joystick up/down to select the route desired for navigation and press . The display will show the options available.
3. Use the Joystick to select **Set Navi** and press ↵. To the right of the route, an asterisk will appear to signal that the route has been activated.
4. Press ESC to exit. At this point, the **Map** and **Compass** pages will refer to the first waypoint.

For further details regarding the use of the Map and Compass pages, refer to par. 8.2 and 8.4

Obviously, only one navigation route can be activated at a time. Selecting another route overrides the previous route selected.

*If you wish to turn off the navigation of all routes, follow the above procedure, selecting **Cancel Navi** at step 3.*

10.3 Adding a waypoint to a route

To add waypoints to a route:

1. Enter the **Routes** menu (steps 1 through 3 of paragraph 10.1).
2. Move the Joystick up/down to select the route to modify.
3. Press . The display will show the options available on the **Routes** menu (J1):
4. Using the Joystick, highlight **Edit** and press ↵. The display will show the route, including the previously inserted waypoints (K1):
5. Press . The display will show the available options (L1):
6. Using the Joystick, select **Add WP** and press ↵. The display will highlight the entire list of previously programmed waypoints. Press ↵ again.
7. You can now select an individual waypoint by moving the Joystick up/down. Once you have selected the first waypoint, press ↵.
8. Press ESC to exit.
9. Move the Joystick down to highlight [✓] and press ↵ to confirm.

10. Move the Joystick to highlight ✓ and press ↵ to confirm.
11. Press ESC to return to the main screens.

10.4 Inverting the order of waypoints

You can invert the order of waypoints so that the starting waypoint becomes the destination waypoint, and vice-versa. This is a useful function, particularly when you are navigation on a route which you would like to return upon.

From any page:

1. Press 📄 twice.
2. Select **Routes** and press ↵.
3. Select the route where to invert the order of waypoints and press ↵.
4. Press 📄.
5. Select **Invert**.
6. Confirm with ✓ and press ↵ to confirm. The display will show the modified route.
7. Press ESC to return to the main screens.

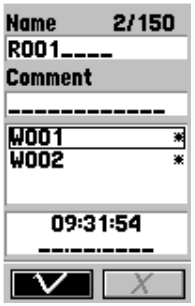
10.5 Inserting a waypoint between two existing waypoints

If you wish to drastically modify the waypoint sequence of a route, it may be easier to insert a waypoint between two previously programmed waypoints.

From any page:

1. Press 📄 twice.
2. Select **Routes** and press ↵.
3. Select the route to modify and press ↵.
4. Move the Joystick up/down to highlight the list of waypoint and press ↵.
5. Move the Joystick up/down to highlight the waypoint immediately after the position where the new waypoint will be inserted and press ↵; above and underneath the waypoint, you'll see …….. ……
6. Press 📄. The display will show the options available (M1).
7. To insert a new waypoint before the one selected at step 6, highlight **Insert** by moving the Joystick.
8. Press ↵. The list of all waypoints previously stored will be displayed. Press ↵ again.
9. Move the Joystick up/down to select the waypoint for insertion and press ↵.
10. Once you have finished, press ESC to exit (the list of all waypoints is displayed).
11. Move the Joystick down to highlight ✓ and press ↵ to confirm. The display will show the modified route.

(K1)



(M1)

12. Move the Joystick up/down to highlight and press ↵ to confirm.
13. Press ESC to return to the main screens.

10.6 Removing a waypoint from a route

To remove a waypoint from a route:

From any page:

1. Press ☰ twice.
2. Select **Routes** and press ↵.
3. Select the route where you want to remove the waypoint and press ↵.
4. Move the Joystick up/down to highlight the list of the waypoints and press ↵.
5. Move the Joystick up/down to highlight the waypoint to delete.
6. Press ☰ and then ↵.
7. To confirm, press ↵ again.
8. Press ESC and move the Joystick up/down to highlight and press ↵ to confirm.
9. Press ESC to return to the main screens.

10.7 Removing all the waypoints from a route and creation of a new route

To remove all the waypoints from a route:

1. Follow steps 1 and 2 of paragraph 10.6.
2. Select the routes whre to remove all the waypoints and press ↵.
3. Move the joystick up/down to highlight the list of waypoints.
4. Press ☰ and select **Delete All**; press ↵.
5. Press ↵ to confirm.
6. Press ☰ and select **Add** with the Joystick, then push ↵. You will see the screen where to create a new waypoint (see paragraph 10.1, from step 9 on).

11. Track memorizing

When you are travelling using waypoints as reference indicators, leave a track. Tracks consist of a series of positions relative to the actual route travelled, and which are registered at regular intervals (of time and space) during your trip by your MAP 500. This track can be used again when you are traveling along the same route, or for verifying that you have correctly followed a previously programmed route. MAP 500 can memorize up to 2500 positions per route: 8 in its memory, and one for current use.
Data points are generated when the device is in movement. The date on which a track is created will be saved with each track.

11.1 Activating the tracking

1. *From any page*, press the button twice, or press once, highlight **Main Menu** using the Joystick and press ↵. The display will show (N1):
2. Using the Joystick, highlight **Track Logs** and press ↵. The following screen will appear (O1):
3. If you wish, use the Joystick and ↵ button to change the recording mode shown under **Tracking**:
   - **Off** - excluded
   - **Fill** – recording of points until the memory space is filled (up to 2500 positions)
   - **Wrap** – continual recording of points (when the memory is full, new points will substitute the oldest ones, in order of memorization)
   - **Continue** - Continual recording of points on all 8 tracks available.
4. Press and use the Joystick to highlight **Recording Mode**, then press ↵.
5. If you wish, you can change the distance-travelled interval between one point and the next (Dist. Interval) or the time interval between one position and the next (**Time Interval**). Use the Joystick and ↵ button as usual.
6. Move the Joystick up/down to highlight [✓] and press ↵ to confirm. You will be returned to the page shown in step 2.
7. Move the Joystick up/down to highlight [✓] and press ↵ to confirm. You will be returned to the main screens, and as soon as MAP 500 has identified your position, it will begin to record the track, showing this on the map with a dotted line.

*If you choose **Fill** at step 3 and the memory space has reached 2500 positions, MAP 500 will prompt you to answer the question **Tracking Full, save or clear?** Press ↵. The display will show the screen appearing in step 2. The next paragraph explains the options available.*

(N1)

(O1)

11.2 Tracking options

1. When the screen from step 2 of the previous paragraph is open, press . You have a number of options available which can be selected using the Joystick at the ↵ button:
   - **Clear Tracking** – deletes all tracking data in use
   - **Save tracking** – saves data from tracking in use
   - **Delete** – deletes the previously memorized tracking (selected from the list using the Joystick)
   - **Show ON/OFF** – shows/hides tracking data from the map, selected from the list using the Joystick.
   - **Edit & Info** – for consulting data contained in a selected track (e.g., the number of points memorized, the date, and the area of interest).
   - **Tracking Distance** – length of the tracking covered
   - **Recording Mode** – modifies the recording modes of the tracking.

Once you have chosen the desired option, move the Joystick up/down to highlight and press ↵ to confirm. You will be returned to the main screens.

12. Troubleshooting

If you run into difficulty with MAP 500, this table might help to resolve your problems. If not, contact your supplier or service centre and describe in as much detail as possible the way in which the device is malfunctioning.

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
MAP 500 doesn't turn on	Batteries are not inserted correctly Batteries are low Battery contacts are dirty	Ensure you have inserted the batteries correctly, that the batteries are charged, and, if necessary, clean the contacts	4.2.b
Batteries don't last very long	This can be expected if the GPS energy saver is not inserted Rechargeable batteries are not the correct type, are charged incorrectly, and/or are experiencing a "memory effect" You are using the display backlighting too frequently	Try to insert the energy saver Ensure the batteries are the correct type, that they are properly charged, and/or eliminate the memory effect Backlighting increases consumption. Reduce its use to a minimum	7.1.b 4.2.a 6.3
GPS will not function in operating mode	There is insufficient open space overhead MAP 500 is connected too close to interference devices (televisions, computers, transceivers, air conditioners, etc) Logical malfunction	Move to a more open area. Try to monitor the signals using the Satellites page Move MAP 500 further away from interference devices Remove the batteries for a few minutes and try to insert them again	8.1 - 4.2.b
GPS takes a long time to begin functioning in operating mode	You have travelled more than 500Km with the device turned off and/or with insufficient open space overhead for reception	Ensure you have enough open space overhead, then turn off the device and turn it back on again. You can also try to initialize it.	5.2
GPS doesn't update its position on the display	You are in Simulation mode	Put the device in navigation mode	7.1.b
The displayed time is incorrect	You have chosen an incorrect time difference (time zone difference from Greenwich) for your current position	Select the correct time zone difference	8.3.a
Measurements displayed on the GPS are incorrect or incomprehensible	An incorrect unit of measure for your requirements has been selected (e.g., miles data, if you wish metric data) and/or the reference system on your map is different from the selected one	Enter the correct unit regarding current application and/or use coordinate system and data system fitting to the current map.	7.1.e 7.2.b
GPS has acquired 3 or more satellites, but is not displaying your position	The acquired satellites are all located in one quadrant of the sky (the **DOP** value (Diluition of Position) on the **Satellites** page is too high)	When this happens, MAP 500 will not display your position because the margin of error is too high. Move to another area to acquire satellites from other quadrants	-

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
On the Map page, your position is not longer displayed	You have selected the **View Map** ⊕ mode rather than **Navigation** ▲ mode	Press the ↵ button	Step 4 of 8.2
You are unable to delete waypoints	The waypoints you are trying to delete have been inserted in a route	Remove the waypoints you are deleting from the route	10.6 10.7
You are unable to program waypoint coordinates	You have selected a map reference with a different standard from WGS-1984	You can only program waypoint coordinates using WGS-1984. Select it	7.2.c
You are unable to navigate along a route	Programming a route is not enough; you also have to active it before using the route for navigation	Activate the route for navigation	10.2
The Change Next WP command is disabled	To navigate using a route and select a next waypoint, you must first program a route	Program the waypoints and the route	9 10
Map details are not displayed as they should be	It is possible to show all details or only those which you wish to show (using the correct commands)	Refer to the paragraphs noted to the right of this box, and follow the instructions according to your needs	Step 3 of 8.2 8.2.g
The data being read do not coincide with the data on a paper map	It is possible that the reference system or the design standard of the map is not the same as the one being used in your MAP 500	Refer to the paragraphs to the right of this box	7.2.c 7.2.b
During the recording of the tracking, an error message appears which appears each time you turn on the device	You have reached the maximum capacity of the tracking	Save or delete the tracking	11.2
A PC or other device is not able to receive data from your MAP 500	For PDA's there are existing different standards for the lead connections and communication protocols. Use RS-232 cable only for connections with COM port to PCs and Notebooks. By using MapShow, always pay attention to start first the data communication at the GPS and thereafter the transmission at the PC. The NMEA interface must be activated since the unit has to deliver the GPS data with NMEA standard to another equipment.	Make sure that you selected the correct COM port and the general NMEA protocol in the used software programs. On newer Notebooks a COM port is missing sometimes. In that case you need an USB lead instead of the RS-232 cable or a seriell "9pin on USB" connection. Use only the associated USB driver!	7.1.c
The data transmission between ALAN MAP500 and MapShow (on PC) does not occur	By using MapShow pay absolutely attention to start first the data communication at the GPS and after that the transmission at the PC. When working with MapShow, the NMEA protocol may not be activated.	By using MapShow, pay attention to the correct transmission direction! Mapshow 2.0.2. has symbols like PC->GPS and GPS->PC. Leave the NMEA function switched off. The correct sequence is to be observed, because with this procedure the used COM port number is recognized automatically! A manual COM port selection is neither necessary nor possible!	

13. Optional accessories

A. Mount for MAP 500

When using your MAP 500 in a vehicle, attach it to its mount to the dashboard using the 3M tape supplied. For optimal reception and signal reading, move the receiver as close as possible to the windshield and keep it at a 45° angle to the sky. We recommend using an external antenna.

B. Data cable

2 kinds of cable are available:

- *RS232 lead* (9pin SUB-D connector for COM port) - with some versions in the scope of supply;
- *an optional USB lead* for the data transmission between PC and GPS, (Download/Upload) and as NMEA 0183 interface for other applications of software usable.

C. Active external antenna

The active antenna improves satellite reception for mobile use inside vehicles. Windshields with dark screens may negatively influence reception. In this case, using an active antenna resolves the problem. Insert the active antenna's male MCX connector into MAP 500's external antenna connector and attach to antenna above the roof of the vehicle, on the sun visor, or somewhere that has a very ample view of the sky.

D. Adaptor for cigarette lighter plug

When applying a voltage between 12 and 26 VDC to this connector, you provide a power supply to the receiver and simultaneously charge the batteries.

E. Rechargeable Batteries

Two rechargeable Ni-MH high-capacity AA batteries are supplied.

F. Memory card

For memorizing digital maps, you can use CF cards of various capacities: 16, 32, 64, 96, 128, 256 and 512 MB too. With the operating system V2.02ZA-CF, also the waypoint/route and track log files are written on CF-card (when required, downloads of updates are possible over internet).

G. Maps

Various CDs are available (optional), such as the European set on 2 CDs or the limited version with Germany maps only

14. The Global Positioning System (GPS) network

GPS is a world-wide radio navigation system formed by a group of 24 satellites (21 operating and 3 spares) and their associated ground stations. GPS uses these satellites, appropriately called NAVSTAR (Navigation Satellite Timing and Ranging), to calculate ground positions. The basis of GPS operation is the use of triangulation from the satellites. To triangulate, a GPS receiver measures distance using the travel time of radio signals. However, to measure travel time, GPS needs very accurate timing, plus it needs to know exactly where the satellites are in space. To solve this problem, each of the 24 satellites is inserted into an orbit high enough (12,000 miles) to preclude interference from other objects, both man-made and natural, and to insure overlapping coverage on the ground so that a GPS receiver can always receive from at least four of them at any given time. In addition, compensation is inserted for any delay the signal experiences as it travels through the atmosphere to the receiver.

The GPS network was originally conceived by the U.S. Department of Defense (DOD) to aid navigation.

14.1 How the system works

With the satellites operating at 12,000 miles above the earth's surface, they are arranged in strategic positions and orbit around the earth at a speed of 17,000 miles-per-hour, thereby completing an earth orbit every 12 hours. Each is powered by solar energy; if that fails, they are equipped with on-board backup batteries to maintain operational GPS integrity, and with small rocket boosters to keep them flying along the correct path.

14.2 Satellite Frequency and control signals

Each satellite transmits a low-power radio signal in the UHF frequency range; the frequencies used are designated as L1, L2, etc. GPS receivers, such as the PMR-GPS unit, listen on the L1 frequency of 1575.42 MHz. This signal, since it is line-of-sight, will reach the ground receiver unless it is obstructed by solid objects, such as buildings and mountains.

The L1 signal is accompanied by a pair of pseudo-random signals (referred to as a pseudo-random code) which is unique to each satellite. These codes are identified by the GPS receiver and allow for the calculation of the travel time from the satellite to the ground. If this travel time is multiplied by the speed of light, the result is the satellite range (distance from satellite to receiver). The navigation information provided by each satellite consists of orbital and clock data, plus delay information based on an ionospheric model. Signal timing is provided by highly accurate atomic clocks.

14.3 Ground control

There are five GPS ground control stations - Hawaii, Ascension Island, Diego Garcia, Kwajalein and Colorado Springs - that control the satellites by checking their operational disposition and exact position in space. Four of these stations are unmanned, and the fifth -- Colorado Springs – is the Master station. The four unmanned stations constantly receive data and send it to the Master station. The Master station then provides corrections for satellite Ephemeris constants and clock offsets and, in conjunction with two other antenna sites, uplinks these information to the satellites.

14.4 The GPS receiver

The GPS receiver, (in this case, the PMR-GPS unit), uses NAVSTAR satellite signals as a way of determining exact position on earth. Mathematically, you need four satellite ranges to accomplish these coordinates. Although three ranges are enough, an additional range is required for technical purposes.

So, our position is based on how long it takes for a signal sent from the satellite to arrive at our receiver. Since timing is everything, the satellite signal is almost perfect since it has an atomic clock on board. But, what about our GPS receiver timing? Our receiver certainly contains no atomic clock; if it did, its cost would be prohibitive -- nobody could afford it. To get around this problem, our receiver must take an additional satellite measurement. Hence, it really needs four satellite signals to insure our correct position. Since this fourth measurement, done as a cross check, does not intersect with the first three, our receiver's computer says, in effect, there is a discrepancy in my measurements, and I must not be synchronized with universal time. Since any offset from universal time will affect all of our measurements, the receiver looks for a single correction factor that it can subtract from all its timing measurements that would cause them all to intersect at a single point. That correction brings the receiver's clock back into sync with universal time and, in this way, atomic timing accuracy is in the palm of your hand!

Once our receiver has that correction, it applies to all the rest of its measurements and now we've got precise positioning.

15. Technical characteristics

Map

- Scale view: 50m – 200 Km with 9 levels of zoom (enlarge/reduce)
- Memory card: Compact Flash (CF) by Scandisk or another 100% compatible brand
- Map memory capacity: In combination with Mapshow CRD vector detailed maps can be modified to .LST files and loaded on CF cards.

Navigation

- Waypoints: up to 1000 waypoints, including their names, comments, and display
- Routes: up to 50 routes, each with a maximum of 150 waypoints
- Tracking: up to 9 recordings of movement – 8 in memory and 1 in use, with a maximum of 2500 points each. Movement recording mode modifiable.

Functions

- Receives and synchronizes up to 12 satellites
- Acquisition time:
  - First start-up: 300 seconds, on average
  - Already turned on in the area: 40 seconds, on average
  - Already warm: 15 seconds, on average
  - Speed of satellite acquisition: every 0.1 second
  - Speed of data update: every second

Precision

- Position: 5 – 25 meters
- Speed: within 0.1m/second
- Time: ± 1 µS

Measurement fields

- Altitude: from -1.000 to 18.000 m
- Speed: within 515 m per second
- Acceleration: ± 4 G

Interface
- Optional USB cable for PC

Data
- 219 geographic reference systems pre-programmed in the factor and user-selected

Antenna
- Integrated, with the possibility of an optional antenna with MCX connector

Dimensions and power supply
- Size: 6.2 x 13 x 3 cm
- Weight: 200 gr. including 2 AA batteries and the CF card
  147 gr. (batteries and CF card excluded)
- Batteries: 2 AA batteries (alkaline or rechargeable)

Screen
- 4 shades of grey
- Size: 6.0 x 3.8 cm
- Backlighting: high-contrast electro-luminescent
- Resolution: 100 x 160 pixels

Other
- Buttons: 6 functional plus 1 4-direction Joystick
- Operating environment: from -10° to +70°C
- Storage: from -40° to +85°C

16. Assistance

We recommend you to write the serial number of your transceiver in the space provided below. This number is found on the rear panel of the transceiver and will be useful in the event of repair/assistance and/or loss and/or theft.

Serial number _____

16.1 Notes about this manual
Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. The manufacturer assumes no responsibility for the results of errors beyond its control. Standard accessories and options can be different according to each country version. The described functions are referred to the software version available at the printing date.
Errors and Omissions Excepted
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17. Appendix A – Reference table of pre-loaded maps

MAP 500 supports 219 references from pre-loaded maps (including the most commonly used WGS-84 factor pre-defined) as listed in the below table. To change references, refer to par. 7.2.c.

With the choice of national usual coordinate systems, the associated date changes automatically (e.g. POTSDAM with German Grid (Gauss Krueger)

	Datum	dX	dY	dZ	Ellipsoid	Region of use	Name in ALAN MAP500
1.	WGS-84	0	0	0	WGS 84	Global	WGS 1984
2.	Adindan	-118	-14	218	Clarke 1880	Burkina Faso	Adindan- Burkina Faso
3.	Adindan	-134	-2	210	Clarke 1880	Cameroon	Adindan- Cameroon
4.	Adindan	-165	-11	206	Clarke 1880	Ethiopia	Adindan- Ethiopia
5.	Adindan	-123	-20	220	Clarke 1880	Mali	Adindan- Mali
6.	Adindan	-166	-15	204	Clarke 1880	Mean for Ethiopia; Sudan	Adindan-Regional Mean
7.	Adindan	-128	-18	224	Clarke 1880	Senegal	Adindan- Senegal
8.	Adindan	-161	-14	205	Clarke 1880	Sudan	Adindan- Sudan
9.	Afgooye	-43	-163	45	Krassovsky 1940	Somalia	Afgooye- Somalia
10.	Ain el Abd 1970	-150	-250	-1	International 1924	Bahrain	Ain el Abd'70- Bahrain
11.	Ain el Abd 1970	-143	-236	7	International 1924	Saudi Arabia	Ain el Abd'70- Saudi Arabia
12.	American Samoa 1962	-115	118	426	Clarke 1866	American Samoa Islands	American Samoa'62
13.	Anna 1 Astro 1965	-491	-22	435	Australian National	Cocos Islands	Anna 1 Astro'65
14.	Antigua Island Astro 1943	-270	13	62	Clarke 1880	Antigua (Leeward Islands)	Antigua Island Astro'43
15.	Arc 1950	-138	-105	-289	Clarke 1880	Botswana	Arc'50- Botswana
16.	Arc 1950	-153	-5	-292	Clarke 1880	Burundi	Arc'50- Burundi
17.	Arc 1950	-125	-108	-295	Clarke 1880	Lesotho	Arc'50- Lesotho
18.	Arc 1950	-161	-73	-317	Clarke 1880	Malawi	Arc'50- Malawi
19.	Arc 1950	-143	-90	-294	Clarke 1880	Mean for Botswana; Lesotho; Malawi; Swaziland; Zaire; Zambia; Zimbabwe	Arc'50-Regional Mean
20.	Arc 1950	-134	-105	-295	Clarke 1880	Swaziland	Arc'50- Swaziland
21.	Arc 1950	-169	-19	-278	Clarke 1880	Zaire	Arc'50- Zaire
22.	Arc 1950	-147	-74	-283	Clarke 1880	Zambia	Arc'50- Zambia
23.	Arc 1950	-142	-96	-293	Clarke 1880	Zimbabwe	Arc'50- Zimbabwe
24.	Arc 1960	-160	-6	-302	Clarke 1880	MEAN FOR Kenya; Tanzania	Arc'60- Mean of Kenya, Tanzania
25.	Arc 1960	-157	-2	-299	Clarke 1880	Kenya	Arc'60- Kenya
26.	Arc 1960	-175	-23	-303	Clarke 1880	Tanzania	Arc'60- Tanzania
27.	Ascension Island 1958	-205	107	53	International 1924	Ascension Island	Ascension Island'58
28.	Astro Beacon E 1945	145	75	-272	International 1924	Iwo Jima	Astro Beacon E'45
29.	Astro DOS 71/4	-320	550	-494	International 1924	St Helena Island	Astro DOS 71/4
30.	Astro Tern Island (FRIG) 1961	114	-116	-333	International 1924	Tern Island	Astro Tern Island
31.	Astronomical Station 1952	124	-234	-25	International 1924	Marcus Island	Astronomical Station'52
32.	Australian Geodetic 1966	-133	-48	148	Australian National	Australia; Tasmania	Australian Geodetic'66
33.	Australian Geodetic 1984	-134	-48	149	Australian National	Australia; Tasmania	Australian Geodetic'84
34.	Ayabelle Lighthouse	-79	-129	145	Clarke 1880	Djibouti	Ayabelle Lighthouse
35.	Bellevue (IGN)	-127	-769	472	International 1924	Efate & Erromango Islands	Bellevue
36.	Bermuda 1957	-73	213	296	Clarke 1866	Bermuda	Bermuda 1957
36a.	Berne	Berna map data for Swiss lattice (Swiss grid)					
37.	Bissau	-173	253	27	International 1924	Guinea-Bissau	Bissau
38.	Bogota Observatory	307	304	-318	International 1924	Colombia	Bogota Observatory
39.	Bukit Rimpah	-384	664	-48	Bessel 1841	Indonesia (Bangka & Belitung Ids)	Bukit Rimpah
40.	Camp Area Astro	-104	-129	239	International 1924	Antarctica (McMurdo Camp Area)	Camp Area Astro

Appendix A – Reference table of pre-loaded maps

	Datum	dX	dY	dZ	Ellipsoid	Region of use	Name in ALAN MAP500
41.	Campo Inchauspe	-148	136	90	International 1924	Argentina	Campo Inchauspe
42.	Canton Astro 1966	298	-304	-375	International 1924	Phoenix Islands	Canton Astro'66
43.	Cape	-136	-108	-292	Clarke 1880	South Africa	Cape- South Africa
44.	Cape Canaveral	-2	151	181	Clarke 1866	Bahamas; Florida	Cape Canaveral
45.	Carthage	-263	6	431	Clarke 1880	Tunisia	Carthage- Tunisia
46.	Chatham Island Astro 1971	175	-38	113	International 1924	New Zealand (Chatham Island)	Chatham Island Astro'71
47.	Chua Astro	-134	229	-29	International 1924	Paraguay	Chua Astro- Paraguay
48.	Corrego Alegre	-206	172	-6	International 1924	Brazil	Corrego Alegre
49.	Dabola	-83	37	124	Clarke 1880	Guinea	Dabola- Guinea
50.	Deception Island	260	12	-147	Clarke 1880	Deception Island; Antarctia	Deception Island
51.	Djakarta (Batavia)	-377	681	-50	Bessel 1841	Indonesia (Sumatra)	Djakarta-Batavia
52.	DOS 1968	230	-199	-752	International 1924	New Georgia Islands (Gizo Island)	DOS 1968
53.	Easter Island 1967	211	147	111	International 1924	Easter Island	Easter Island'67
54.	Estonia Coordinate System 1937	374	150	588	Bessel 1841	Estonia	Estonia Coord Sys'37
55.	European 1950	-104	-101	-140	International 1924	Cyprus	Euro'50- Cyprus
56.	European 1950	-130	-117	-151	International 1924	Egypt	Euro'50- Egypt
57.	European 1950	-86	-96	-120	International 1924	England; Channel Islands; Scotland; Shetland Islands	Euro'50- England
58.	European 1950	-86	-96	-120	International 1924	England; Ireland; Scotland; Shetland Islands	Euro'50- North Regional Mean
59.	European 1950	-87	-95	-120	International 1924	Finland; Norway	Euro'50- Finland,Norway
60.	European 1950	-84	-95	-130	International 1924	Greece	Euro'50- Greece
61.	European 1950	-117	-132	-164	International 1924	Iran	Euro'50- Iran
62.	European 1950	-97	-103	-120	International 1924	Italy (Sardinia)	Euro'50-Italy-Sardinia
63.	European 1950	-97	-88	-135	International 1924	Italy (Sicily)	Euro'50-Italy-Sicily
64.	European 1950	-107	-88	-149	International 1924	Malta	Euro'50-Malta
65.	European 1950	-87	-98	-121	International 1924	Mean for Austria; Belgium; Denmark; Finland; France; W Germany; Gibraltar; Greece; Italy; Luxembourg; Netherlands; Norway; Portugal; Spain; Sweden; Switzerland	Euro'50-West Regional Mean
66.	European 1950	-87	-96	-120	International 1924	Mean for Austria; Denmark; France; W Germany; Netherlands; Switzerland	Euro'50-East Regional Mean
67.	European 1950	-103	-106	-141	International 1924	Mean for Iraq; Israel; Jordan; Lebanon; Kuwait; Saudi Arabia; Syria	Euro'50-South Regional Mean
68.	European 1950	-84	-107	-120	International 1924	Portugal; Spain	Euro'50- Portugal,Spain
69.	European 1950	-112	-77	-145	International 1924	Tunisia	Euro'50- Tunisia
70.	European 1979	-86	-98	-119	International 1924	Mean for Austria; Finland; Netherlands; Norway; Spain; Sweden; Switzerland	European 1979
71.	Fort Thomas 1955	-7	215	225	Clarke 1880	Nevis; St. Kitts (Leeward Islands)	Fort Thomas 1955
72.	Gan 1970	-133	-321	50	International 1924	Republic of Maldives	Gan 1970
73.	Geodetic Datum 1949	84	-22	209	International 1924	New Zealand	Geodetic Datum'49
74.	Graciosa Base SW 1948	-104	167	-38	International 1924	Azores (Faial; Graciosa; Pico; Sao Jorge; Terceira)	Graciosa Base SW'48
75.	Guam 1963	-100	-248	259	Clarke 1866	Guam	Guam'63 Guam
76.	Gunung Segara	-403	684	41	Bessel 1841	Indonesia (Kalimantan)	Gunung Segara
77.	GUX 1 Astro	252	-209	-751	International 1924	Guadalcanal Island	GUX 1 Astro
78.	Herat North	-333	-222	114	International 1924	Afghanistan	Herat North
79.	Hermannskogel Datum	653	-212	449	Bessel 1841 (Namibia)	Croatia -Serbia, Bosnia-Herzegovina	Hermannskogel Datum
80.	Hjorsey 1955	-73	46	-86	International 1924	Iceland	Hjorsey 1955
81.	Hong Kong 1963	-156	-271	-189	International 1924	Hong Kong	Hong Kong'63
82.	Hu-Tzu-Shan	-637	-549	-203	International 1924	Taiwan	Hu-Tzu-Shan
83.	Indian	282	726	254	Everest (India 1830)	Bangladesh	Indian- Bangladesh
84.	Indian	295	736	257	Everest (India 1956)	India; Nepal	Indian- India,Nepal

	Datum	dX	dY	dZ	Ellipsoid	Region of use	Name in ALAN MAP500
85.	Indian	283	682	231	Everest (Pakistan)	Pakistan	Indian- Pakistan
86.	Indian 1954	217	823	299	Everest (India 1830)	Thailand	Indian 1954
87.	Indian 1960	182	915	344	Everest (India 1830)	Vietnam (Con Son Island)	Indian'60- Con Son Island
88.	Indian 1960	198	881	317	Everest (India 1830)	Vietnam (Near 16øN))	Indian'60-Vietnam
89.	Indian 1975	210	814	289	Everest (India 1830)	Thailand	Indian 1975
90.	Indonesian 1974	-24	-15	5	Indonesian 1974	Indonesia	Indonesian'74
91.	Ireland 1965	506	-122	611	Modified Airy	Ireland	Ireland 1965
92.	ISTS 061 Astro 1968	-794	119	-298	International 1924	South Georgia Islands	ISTS 061 Astro'68
93.	ISTS 073 Astro 1969	208	-435	-229	International 1924	Diego Garcia	ISTS 073 Astro'69
94.	Johnston Island 1961	189	-79	-202	International 1924	Johnston Island	Johnston Island'61
95.	Kandawala	-97	787	86	Everest (India 1830)	Sri Lanka	Kandawala
96.	Kerguelen Island 1949	145	-187	103	International 1924	Kerguelen Island	Kerguelen Island'49
97.	Kertau 1948	-11	851	5	Everest (Malay.&Sing)	West Malaysia & Singapore	Kertau 1948
98.	Kusaie Astro 1951	647	1777	-1124	International 1924	Caroline Islands	Kusaie Astro'51
99.	Korean Geodetic System	0	0	0	GRS 80	South Korea	Korean Geo Sys
100.	L. C. 5 Astro 1961	42	124	147	Clarke 1866	Cayman Brac Island	L. C. 5 Astro'61
101.	Leigon	-130	29	364	Clarke 1880	Ghana	Leigon
102.	Liberia 1964	-90	40	88	Clarke 1880	Liberia	Liberia 1964
103.	Luzon	-133	-77	-51	Clarke 1866	Philippines (Excluding Mindanao)	Luzon-Philip
104.	Luzon	-133	-79	-72	Clarke 1866	Philippines (Mindanao)	Luzon-Philip- Mindanao
105.	M'Poraloko	-74	-130	42	Clarke 1880	Gabon	M'Poraloko
106.	Mahe 1971	41	-220	-134	Clarke 1880	Mahe Island	Mahe 1971
107.	Massawa	639	405	60	Bessel 1841	Ethiopia (Eritrea)	Massawa
108.	Merchich	31	146	47	Clarke 1880	Morocco	Merchich
108a.	MGI	map data for Austrian lattice					
109.	Midway Astro 1961	912	-58	1227	International 1924	Midway Islands	Midway Astro'61
110.	Minna	-81	-84	115	Clarke 1880	Cameroon	Minna- Cameroon
111.	Minna	-92	-93	122	Clarke 1880	Nigeria	Minna- Nigeria
112.	Montserrat Island Astro 1958	174	359	365	Clarke 1880	Montserrat (Leeward Islands)	Montserrat Island Astro'58
113.	Nahrwan	-247	-148	369	Clarke 1880	Oman (Masirah Island)	Nahrwan-Oman-Masirah Island
114.	Nahrwan	-243	-192	477	Clarke 1880	Saudi Arabia	Nahrwan- Saudi Arabia
115.	Nahrwan	-249	-156	381	Clarke 1880	United Arab Emirates	Nahrwan- United Arab Emirates
116.	Naparima BWI	-10	375	165	International 1924	Trinidad & Tobago	Naparima BWI
117.	North American 1927	-5	135	172	Clarke 1866	Alaska (Excluding Aleutian Ids)	N-Amer'27-Alaska
118.	North American 1927	-2	152	149	Clarke 1866	Alaska (Aleutian Ids East of 180øW)	N-Amer'27-Aleutian Ids E
119.	North American 1927	2	204	105	Clarke 1866	Alaska (Aleutian Ids West of 180øW)	N-Amer'27-Aleutian Ids W
120.	North American 1927	-4	154	178	Clarke 1866	Bahamas (Except San Salvador Id)	N-Amer'27-Bahamas
121.	North American 1927	1	140	165	Clarke 1866	Bahamas (San Salvador Island)	N-Amer'27-San Salvador
122.	North American 1927	-7	162	188	Clarke 1866	Canada (Alberta; British Columbia)	N-Amer'27-Alberta
123.	North American 1927	-9	157	184	Clarke 1866	Canada (Manitoba; Ontario)	N-Amer'27- Manitoba, Ontario
124.	North American 1927	-22	160	190	Clarke 1866	Canada (New Brunswick; Newfoundland; Nova Scotia; Quebec)	N-Amer'27- New Brunswick
125.	North American 1927	4	159	188	Clarke 1866	Canada (Northwest Territories; Saskatchewan)	N-Amer'27- Saskatchewan
126.	North American 1927	-7	139	181	Clarke 1866	Canada (Yukon)	N-Amer'27- Yukon
127.	North American 1927	0	125	201	Clarke 1866	Canal Zone	N-Amer'27-Canal Zone
128.	North American 1927	-9	152	178	Clarke 1866	Cuba	N-Amer'27-Cuba
129.	North American 1927	11	114	195	Clarke 1866	Greenland (Hayes Peninsula)	N-Amer'27-Greenland
130.	North American 1927	-3	142	183	Clarke 1866	Mean for Antigua; Barbados; Barbuda; Caicos Islands; Cuba; Dominican Republic; Grand Cayman; Jamaica; Turks Islands	N-Amer'27-Antigua, Barbados

Appendix A – Reference table of pre-loaded maps

	Datum	dX	dY	dZ	Ellipsoid	Region of use	Name in ALAN MAP500
131.	North American 1927	0	125	194	Clarke 1866	Mean for Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua	N-Amer'27-Costa Rica, El Salvador
132.	North American 1927	-10	158	187	Clarke 1866	Mean for Canada	N-Amer'27- Mean of Canada
133.	North American 1927	-8	160	176	Clarke 1866	Mean for Conus	N-Amer'27-Mean of Conus
134.	North American 1927	-9	161	179	Clarke 1866	Mean for Conus (East of Mississippi; River Including Louisiana; Missouri; Minnesota)	N-Amer'27-E-Mississippi
135.	North American 1927	-8	159	175	Clarke 1866	Mean for Conus (West of Mississippi; River Excluding Louisiana; Minnesota; Missouri)	N-Amer'27-W-Mississippi
136.	North American 1927	-12	130	190	Clarke 1866	Mexico	N-Amer'27-Mexico
137.	North American 1983	0	0	0	GRS 80	Alaska (Excluding Aleutian Ids)	N-Amer'83-Alaska
138.	North American 1983	-2	0	4	GRS 80	Aleutian Ids	N-Amer'83-Aleutian Ids
139.	North American 1983	0	0	0	GRS 80	Canada	N-Amer'83-Canada
140.	North American 1983	0	0	0	GRS 80	Conus	N-Amer'83-Conus
141.	North American 1983	1	1	-1	GRS 80	Hawaii	N-Amer'83-Hawaii
142.	North American 1983	0	0	0	GRS 80	Mexico; Central America	N-Amer'83-Mexico, Central America
143.	North Sahara 1959	-186	-93	310	Clarke 1880	Algeria	North Sahara'59
144.	Observatorio Meteorologico 1939	-425	-169	81	International 1924	Azores (Corvo & Flores Islands)	Observatorio Meteorologico'39
145.	Old Egyptian 1907	-130	110	-13	Helmert 1906	Egypt	Old Egyptian 1907
146.	Old Hawaiian	89	-279	-183	Clarke 1866	Hawaii	Old Hawaiian- Hawaii
147.	Old Hawaiian	45	-290	-172	Clarke 1866	Kauai	Old Hawaiian- Kauai
148.	Old Hawaiian	65	-290	-190	Clarke 1866	Maui	Old Hawaiian- Maui
149.	Old Hawaiian	61	-285	-181	Clarke 1866	Mean For Hawaii; Kauai; Maui; Oahu	Old Hawaiian-Regional Mean
150.	Old Hawaiian	58	-283	-182	Clarke 1866	Oahu	Old Hawaiian- Oahu
151.	Oman	-346	-1	224	Clarke 1880	Oman	Oman
152.	Ordnance Survey Great Britain 1936	371	-112	434	Airy 1830	England	Ord Sur GB'36- England
153.	Ordnance Survey Great Britain 1936	371	-111	434	Airy 1830	England; Isle of Man; Wales	Ord Sur GB'36- Isle of Man
154.	Ordnance Survey Great Britain 1936	375	-111	431	Airy 1830	Mean For England; Isle of Man; Scotland; Shetland Islands; Wales	Ord Sur GB'36-Regional Mean
155.	Ordnance Survey Great Britain 1936	384	-111	425	Airy 1830	Scotland; Shetland Islands	Ord Sur GB'36- Scotland, Shetland
156.	Ordnance Survey Great Britain 1936	370	-108	434	Airy 1830	Wales	Ord Sur GB'36- Wales
157.	Pico de las Nieves	-307	-92	127	International 1924	Canary Islands	Pico de las Nieves
158.	Pitcairn Astro 1967	185	165	42	International 1924	Pitcairn Island	Pitcairn Astro 1967
159.	Point 58	-106	-129	165	Clarke 1880	MEAN FOR Burkina Faso & Niger	Point 58
160.	Pointe Noire 1948	-148	51	-291	Clarke 1880	Congo	Pointe Noire 1948
161.	Porto Santo 1936	-499	-249	314	International 1924	Porto Santo; Madeira Islands	Porto Santo 1936
161a.	Potsdam 1950 German map data with Gauss Krueger coordinate system						
162.	Provisional South American 1956	-270	188	-388	International 1924	Bolivia	Prov S-Amer'56- Bolivia
163.	Provisional South American 1956	-270	183	-390	International 1924	Chile (Northern; Near 19 øS)	Prov S-Amer'56-Chile-North
164.	Provisional South American 1956	-305	243	-442	International 1924	Chile (Southern; Near 43 øS)	Prov S-Amer'56-Chile-South
165.	Provisional South American 1956	-282	169	-371	International 1924	Colombia	Prov S-Amer'56- Colombia
166.	Provisional South American 1956	-278	171	-367	International 1924	Ecuador	Prov S-Amer'56- Ecuador
167.	Provisional South American 1956	-298	159	-369	International 1924	Guyana	Prov S-Amer'56- Guyana
168.	Provisional South American 1956	-288	175	-376	International 1924	Mean for Bolivia; Chile; Colombia; Ecuador; Guyana; Peru; Venezuela	Prov S-Amer'56-Regional Mean
169.	Provisional South American 1956	-279	175	-379	International 1924	Peru	Prov S-Amer'56- Peru
170.	Provisional South American 1956	-295	173	-371	International 1924	Venezuela	Prov S-Amer'56- Venezuela
171.	Provisional South Chilean 1963	16	196	93	International 1924	Chile (Near 53 øS) (Hito XVIII)	Prov S-Chilean'63
172.	Puerto Rico	11	72	-101	Clarke 1866	Puerto Rico; Virgin Islands	Puerto Rico
173.	Pulkovo 1942	28	-130	-95	Krassovsky 1940	Russia	Pulkovo 1942

	Datum	dX	dY	dZ	Ellipsoid	Region of use	Name in ALAN MAP500
174.	Qatar National	-128	-283	22	International 1924	Qatar	Qatar National
175.	Qornoq	164	138	-189	International 1924	Greenland (South)	Qornoq
176.	Reunion	94	-948	-1262	International 1924	Mascarene Islands	Reunion
177.	Rome 1940	-225	-65	9	International 1924	Italy (Sardinia)	Rome 1940
178.	S-42 (Pulkovo 1942)	28	-121	-77	Krassovsky 1940	Hungary	S-42 Pul'42- Hungary
179.	S-42 (Pulkovo 1942)	23	-124	-82	Krassovsky 1940	Poland	S-42 Pul'42- Poland
180.	S-42 (Pulkovo 1942)	26	-121	-78	Krassovsky 1940	Czechoslavakia	S-42 Pul'42- Czechoslavakia
181.	S-42 (Pulkovo 1942)	24	-124	-82	Krassovsky 1940	Latvia	S-42 Pul'42- Latvia
182.	S-42 (Pulkovo 1942)	15	-130	-84	Krassovsky 1940	Kazakhstan	S-42 Pul'42- Kazakhstan
183.	S-42 (Pulkovo 1942)	24	-130	-92	Krassovsky 1940	Albania	S-42 Pul'42- Albania
184.	S-42 (Pulkovo 1942)	28	-121	-77	Krassovsky 1940	Romania	S-42 Pul'42- Romania
185.	S-JTSK	589	76	480	Bessel 1841	Czechoslavakia (Prior 1 JAN 1993)	S-JTSK
186.	Santo (DOS) 1965	170	42	84	International 1924	Espirito Santo Island	Santo DOS'65
187.	Sao Braz	-203	141	53	International 1924	Azores (Sao Miguel; Santa Maria Ids)	Sao Braz
188.	Sapper Hill 1943	-355	21	72	International 1924	East Falkland Island	Sapper Hill'43
189.	Schwarzeck	616	97	-251	Bessel 1841 (Namibia)	Namibia	Schwarzeck
190.	Selvagem Grande 1938	-289	-124	60	International 1924	Salvage Islands	Selvagem Grande'38
191.	Sierra Leone 1960	-88	4	101	Clarke 1880	Sierra Leone	Sierra Leone'60
192.	South American 1969	-62	-1	-37	South American 1969	Argentina	S-Amer'69- Argentina
193.	South American 1969,	-61	2	-48	South American 1969	Bolivia	S-Amer'69- Bolivia
194.	South American 1969,	-60	-2	-41	South American 1969	Brazil	S-Amer'69- Brazil
195.	South American 1969,	-75	-1	-44	South American 1969	Chile	S-Amer'69- Chile
196.	South American 1969,	-44	6	-36	South American 1969	Colombia	S-Amer'69- Colombia
197.	South American 1969,	-48	3	-44	South American 1969	Ecuador	S-Amer'69- Ecuador
198.	South American 1969,	-47	26	-42	South American 1969	Ecuador (Baltra; Galapagos)	S-Amer'69- Baltra, Galapagos
199.	South American 1969,	-53	3	-47	South American 1969	Guyana	S-Amer'69- Guyana
200.	South American 1969,	-57	1	-41	South American 1969	Mean for Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Guyana; Paraguay; Peru; Trinidad & Tobago; Venezuela	S-Amer'69-Regional Mean
201.	South American 1969,	-61	2	-33	South American 1969	Paraguay	S-Amer'69- Paraguay
202.	South American 1969,	-58	0	-44	South American 1969	Peru	S-Amer'69- Peru
203.	South American 1969,	-45	12	-33	South American 1969	Trinidad & Tobago	S-Amer'69- Trinidad,Tobago
204.	South American 1969,	-45	8	-33	South American 1969	Venezuela	S-Amer'69- Venezuela
205.	South Asia	7	-10	-26	Modified Fischer 1960	Singapore	South Asia
206.	Tananarive Observatory 1925	-189	-242	-91	International 1924	Madagascar	Tananarive Observ'25
207.	Timbalai 1948	-679	669	-48	Everest (Sabah Sarawak)	Brunei; E. Malaysia (Sabah Sarawak)	Timbalai 1948
208.	Tokyo	-148	507	685	Bessel 1841	Japan	Tokyo- Japan
209.	Tokyo	-148	507	685	Bessel 1841	Mean for Japan; South Korea; Okinawa	Tokyo-Regional Mean
210.	Tokyo	-158	507	676	Bessel 1841	Okinawa	Tokyo- Okinawa
211.	Tokyo	-147	506	687	Bessel 1841	South Korea	Tokyo- South Korea
212.	Tristan Astro 1968	-632	438	-609	International 1924	Tristan da Cunha	Tristan Astro'68
213.	Viti Levu 1916	51	391	-36	Clarke 1880	Fiji (Viti Levu Island)	Viti Levu 1916
214.	Voirol 1960	-123	-206	219	Clarke 1880	Algeria	Voirol 1960
215.	Wake Island Astro 1952	276	-57	149	International 1924	Wake Atoll	Wake Island Astro'52
216.	Wake-Eniwetok 1960	102	52	-38	Hough 1960	Marshall Islands	Wake-Eniwetok'60
217.	WGS 1972	0	0	0	WGS 72	Global Definition	WGS 1972
218.	Yacare	-155	171	37	International 1924	Uruguay	Yacare
219.	Zanderij	-265	120	-358	International 1924	Suriname	Zanderij